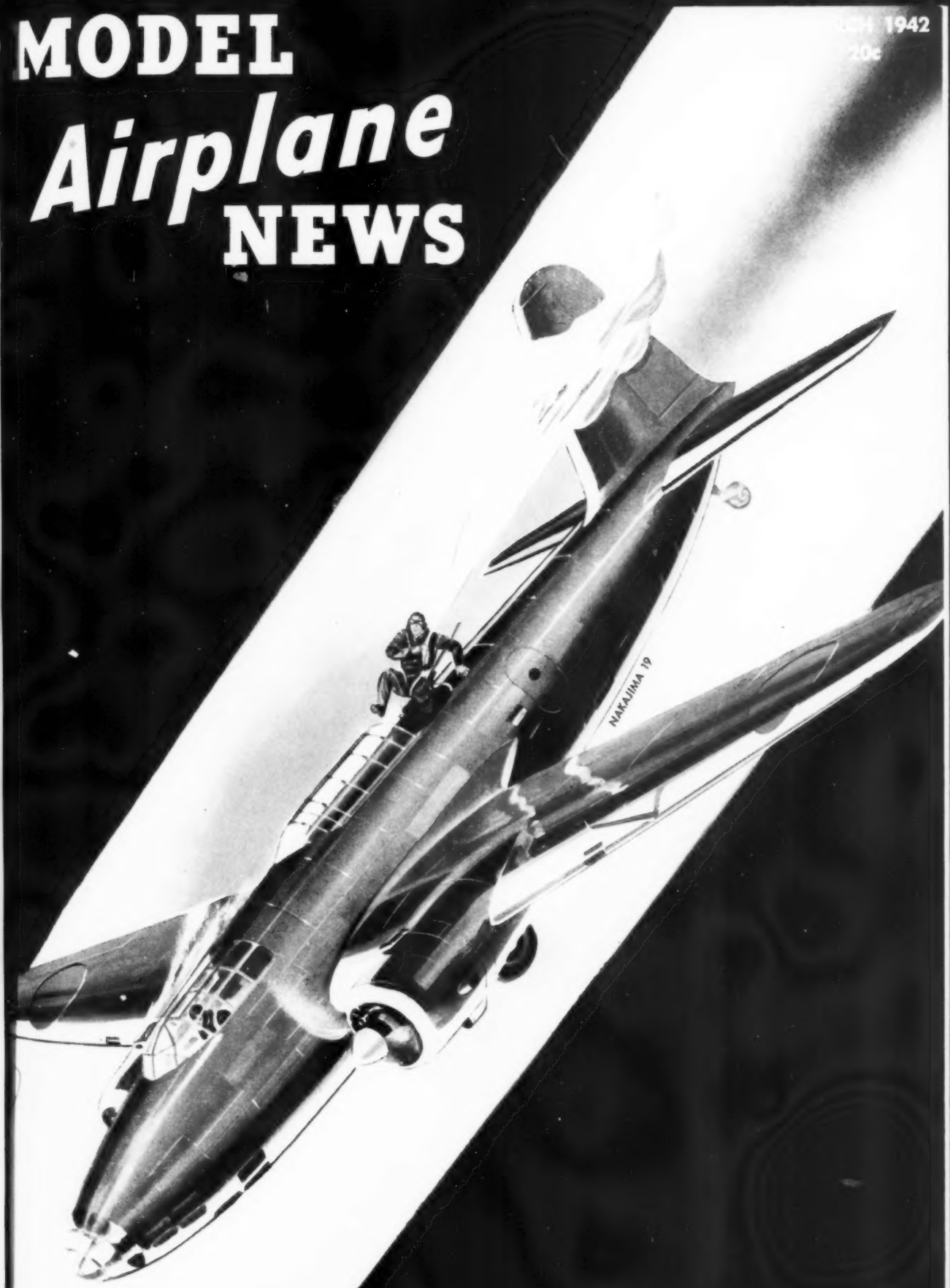
MODEL Airplane NEWS

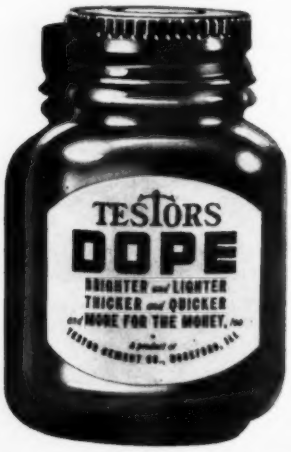
1942
20c



ANOTHER NATIONALS WINNER

1st Choice OF AMERICA'S MODEL BUILDERS

NOW 10¢



BOTTLE and TUBE SHOWN ACTUAL SIZE

AT ALL LEADING 5-AND-10¢ STORES AND HOBBY SHOPS

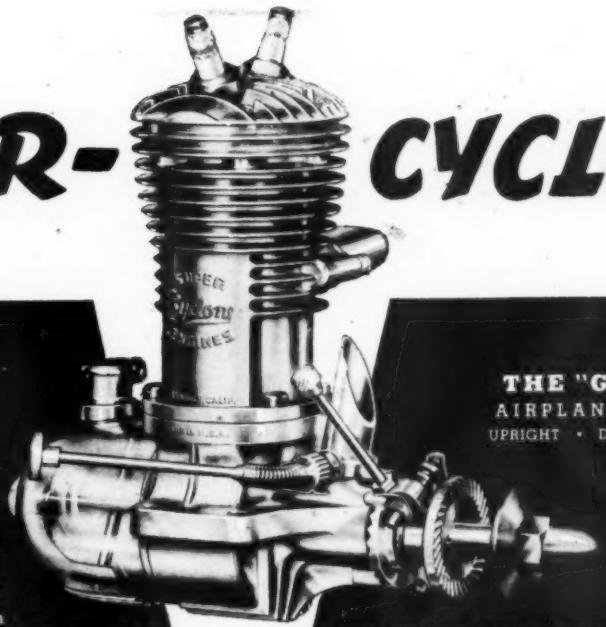
TESTORS *Model Airplane* CEMENTS and DOPES

HIGHEST QUALITY • EXTRA QUANTITY

TESTOR CHEMICAL CO., ROCKFORD, ILLINOIS, U. S. A.

World's Largest Manufacturers of Model Airplane Chemicals

SUPER-CYCLONE



The engine that can "take it"! SUPER-CYCLONE is not only the world's greatest all-around engine in performance and value, but it it built to deliver that performance under the most gruelling competitive tests and over a long period of time. NEVER has this been so important to the purchaser of a miniature engine, as the national emergency is certain to have a serious effect on the model industry. The Office of Production Management has granted Aircraft Industries Co. permission to complete a large production of SUPER-CYCLONE engines according to the same specifications that have made it outstanding in its field. These are now being assembled; however, it is our fundamental belief that National Defense must come before all other considerations and the engine you buy today will probably have to last you a long time. Therefore, you MUST select the engine that starts as the all-around leader and STAYS that way — SUPER-CYCLONE. Many owners report that their SUPER-CYCLONES are running better than ever after two years of service. SUPER-CYCLONE is the finest and most complete engine, with more outstanding engineering features than any other on the market . . . and the proof of its performance is written on the Honor Roll for all to read. Aeronautical Engineers strive to build the lightest possible engines, with maximum horsepower per pound. The same is true of miniature engines, and SUPER-CYCLONE is the lightest big bore Class "C" engine. It weighs only 7 1 2 oz. bare, delivering more power than other big bore engines, although it is 2 to 4 oz. lighter. SUPER-CYCLONE will outpull, outfly and outlast any big bore Class "C" engine on the market. THAT'S PERFORMANCE PLUS!

THE "G" SERIES
AIRPLANE ENGINE
UPRIGHT • DUAL IGNITION
$16.50

SUPER-CYCLONE ON THE NATIONAL HONOR ROLL

- Winner of the National Rail Track Championship
- First Place in Quarter-Mile Cable Track Race Cars
- Longest Airplane Flight of the Meet (All Classes)
- First Place in the Junior Class "C" Airplane Event
- First Prize for the Most Consistent Performance
- Only Engine to Win Both on the Track and in the Air
- Only Race Engine under $35.00 to Place in First 20
- All Winning Engines Privately Owned and Operated

SUPER-CYCLONE ON THE NATIONAL HONOR ROLL

SPECIAL NOTICE—In order to maintain SUPER-CYCLONE'S high quality of materials and craftsmanship in the face of rising costs, it has been necessary for us to raise the price of our engines. This advance has been held to the minimum that will permit us to build the identical engine that has established SUPER-CYCLONE prestige. Orders received before Feb. 1, 1942 will be filled at the previous rates. Our present backlog of orders will account for a majority of the engines now in production, so MAIL YOUR ORDERS TODAY! Orders will be filled in rotation.

NO EXTRAS TO BUY! PRICE INCLUDES COIL, CONDENSER AND MOUNTS

50% Discount

In buying SUPER-CYCLONE direct from the manufacturer, you obtain the world's most complete engine for 1/2 price. Thus you get an engine that would retail through dealers for $29 for only $14.50, or a $35 engine for $17.50.

$15.50

"G-R" SERIES
RACE CAR ENGINE

THE "G-R" SERIES—While the "G" Series engine is designed exclusively for airplanes, the "G-R" can be used successfully in planes, pilot-planes (U-Control), racing hydroplanes and race cars, and has set more race records than any other engine on the market. It's the most versatile engine you can buy!

ORDER BLANK

AIRCRAFT INDUSTRIES CO.,
GRAND CENTRAL AIR TERMINAL, GLENDALE (Los Angeles) CALIFORNIA
HOME OF THE FAMOUS CURTISS-WRIGHT TECHNICAL INSTITUTE

Please send me the items checked.
I enclose POST OFFICE MONEY ORDER

SUPER CYCLONE "G" SERIES
The Airplane Engine. Complete with Mounts and Fully Assembled

☐ Upright Single Ignition . . $14.50 ☐ Upright Dual Ignition . . $16.50
☐ Inverted Single Ignition . . $15.00 ☐ Inverted Dual Ignition . . $17.00

SUPER CYCLONE "G-R" SERIES
The Race Car Engine. Complete and Fully Assembled

☐ Single Ignition . . . . $15.50 ☐ Dual Ignition $17.50

ALL POSTAGE PREPAID IN U.S.A.

PROPELLERS — Finest Quality Obtainable (☐ 14", ☐ 13", ☐ 12") . . 50c
☐ Steel Mounting Brackets . . . 50c

SHIP TO _____ AGE ____
ADDRESS _____
MA-3

FLASH-NEWS

Special to MODEL AIRPLANE NEWS

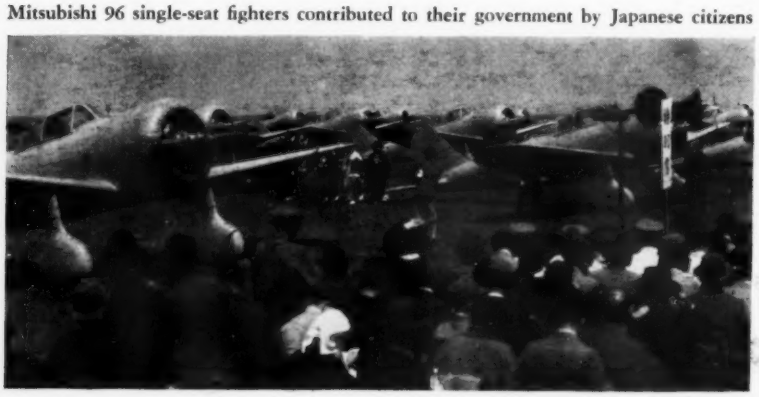
AND so on December 8th, 1941 did the United States go to war with Japan. And on December 11th, 1941 did the United States go to war with Germany and Italy. Since that time we have BEEN AT war with the axis, but Japan has MADE war on us and our Allies. Hong Kong fell, then Luzon Island and Manila, perhaps soon Singapore, too, will fall. War must be MADE not simply declared. A hundred times this past month we have heard: "Where is our Navy?", "Where is our Air Force?" over and over again. We know we have the equipment and the manpower. But all mechanisms, even a "self-winding" clock, are only as good as the man behind them. And he in turn only as good as the man behind him. The true "man behind the man behind the gun" is the officer, who must direct and control the efforts of war machinery and manpower. Prime rule of all fighting men is: "Do as you are told!" and in the telling lies the success or failure of the military venture. The "tellers" then, must hold the key to operations on land, sea or in the air and after the first weeks of American failure President Roosevelt saw due cause to re-examine our "tellers," the officers who run our men and machines. With the Fleet, Admiral Husband E. Kimmel was relieved in favor of Admiral Ernest J. King, long-time aviation-minded officer, for many years Chief of the Bureau of Aeronautics, C.O. of Aircraft Scouting Force, commander of aircraft carriers and air stations. An air officer, at last, controls our naval destiny! Brig. General Henry H. Arnold, Chief of the Air Forces and Deputy Chief of the Army Staff was raised to a Lieut. General, highest peacetime rank permissible for an Army officer, Lieut. General Delos C. Emmons left the Combat Command of the Air Force to take charge of the entire Hawaiian Army Department, General Clarence L. Tinker assumed charge of the Combat Command Air Forces and General George H. Brett, long-time head of the Air Corps became Assistant or Deputy Commander of the Allied forces in the Pacific Area serving under General Wavell of the British Army and the renowned General Chiang Kai-shek of the Chinese Army. Thus does air power move into the foreground of defense and offense military power.

Since it *is* total war how are we fighting the battles of the production lines? No exact figures can be published but we reached a rate of 2500 airplanes *per month* last December. Heretofore this volume has been divided between the R.A.F., Russia and our own Army and Navy airforces; but Lend-Lease, wisely if not tardily, has cut foreign deliveries in favor of home consumption and before this year is out we are certain to have with our Allies the largest airforce in the entire world. Pilot production has multiplied itself and the last mentioned rate was 5,000 per month with a steady increase. It would appear that Victory must come slowly but if an over-powering weight of men and machines, a new command and a will to win are prime requisites, most assuredly the forces of Democracy through Freedom and Liberty will emerge the victors.

A bill, which would subsidize through loans the training of youths for aviation, will shortly be introduced in the Senate and the House. Instigator of the bill is pioneer student-trainer Major C. C. Mosely, president of the Curtiss-Wright Technical Institute and manager of the Cal-Aero and Polaris Army primary training centers. He sent a questionnaire to 53,000 youths who inquired concerning aviation training at his school through answering ads and were never heard from again. Mosely sought why. The answer: 91% have not undertaken training because they could not afford it. 97% desired to train for a career rather than a job; 91% stated they were permanently unable to afford such training and 88% said they

(Continued on page 56)

Mitsubishi 96 single-seat fighters contributed to their government by Japanese citizens



13TH YEAR OF PUBLICATION

MODEL Airplane NEWS

MARCH, 1942 VOL. XXVI, No. 3

CONTENTS

FEATURE
Plane vs. Battleship..... 4

RUBBER POWERED
Modeling the World War Spad 6
National Indoor Fuselage Winner 13
Train by Flying the Fleet Trainer 25

GAS POWERED
Gas Up This Navy Bomber....19

SCALE MODELS
Nakajima 19 Bomber.....23
Ryan YO-51.....31

PLANE ON THE COVER
The Gangsters' "Big Gun".....22

DESIGN
Model Designing Simplified... 8

NEWS
Frontiers 10
Sky Scouts.....12
Air Ways.....16
Lakes Make Good Landing Fields 24
Academy of Model Aeronautics 24

Photos pages 2, 4, 5, 10 and 11 by Acme and International Photo Services

Edited by
Charles Hampson Grant

•

Published monthly by Jay Publishing Corp., Mt. Morris, Illinois. Editorial and advertising offices: 551 Fifth Ave., New York, N.Y. George C. Johnson, President; Jay P. Cleveland, Advertising Manager. Entered as second class matter Dec. 6, 1934 at the post office at Mt. Morris, Ill., under the act of March 3, 1879. Additional entry at New York, N.Y. Price 20c per copy. Subscriptions $2 per year in the United States and possessions; also Canada, Cuba, Mexico, Panama and South America. All other countries $2.50 per year. *Copyright 1942 by Jay Publishing Corp.*

DON'T BE STAMPEDED

in Making the Greatest Decision of Your Life!

Aviation has JOBS for thousands, but CAREERS only for trained men!

AMID the excitement and hysteria of a country newly at war, it is difficult to sit down calmly and make intelligent plans for the future, but never has it been more necessary to do so. Here are the salient points that should govern your decision: (1) This is a war of production. (2) Air power is found to be a determining factor in its outcome. (3) Thousands of men are entering the back door of the aviation industry through cheap "quickie" courses that prepare them for single-phase jobs. BUT — (4) Only thoroughly trained men can fill the vital and well paid supervisory positions, and — most important of all to you, only these Career men can ever hope to retain these positions through the readjustments that must follow when America's production, now geared to war, shifts back to peace time schedules.

The executives who have made aviation THEIR career want men with the intelligence and sincerity to select aviation as a life work and to prepare themselves for it by proper training. They know that the value of each man is largely determined by the ability and experience of those who train him for his career. And they know that Curtiss-Wright Technical Institute graduates are — and for many years have been precisely trained to fill the industry's exacting requirements.

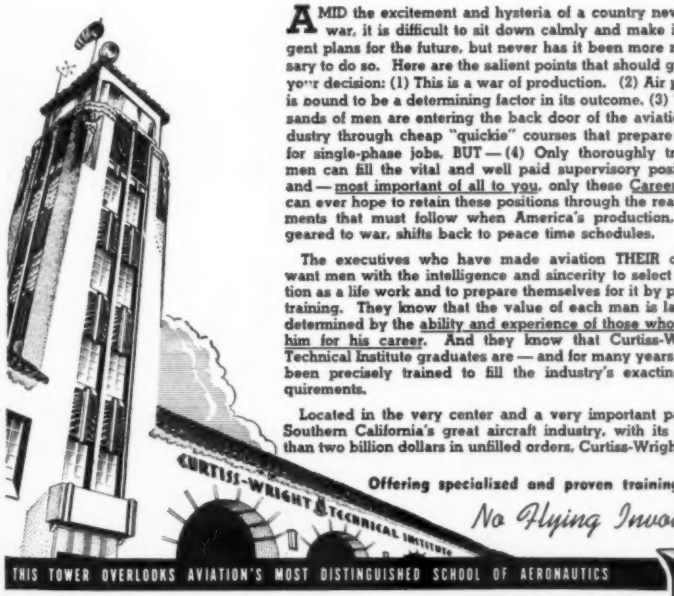
Located in the very center and a very important part of Southern California's great aircraft industry, with its more than two billion dollars in unfilled orders, Curtiss-Wright Tec has come to be recognized as the nation's leading institution for the training of Aeronautical Engineers and Master Mechanics. Mr. Donald Douglas, President of the great Douglas Aircraft Company, chose this school for his own son's training, which pointedly indicates the high standing Curtiss-Wright Tec has attained in the aircraft industry since its establishment in 1929.

It is imperative that before you invest in a course of career training you determine what the returns will be on your investment . . . for your choice of a school in which to take your training will determine how much money you will make all the rest of your life.

Curtiss-Wright Tec's career training is carefully designed to do just one thing:—TO MAKE MONEY FOR YOU, so upon graduation you can be independent and self-supporting for life. Our thousands of successful graduates have proven that Curtiss-Wright Tec training gets results and always pays, since it trained them in advance for the highest position they could ever expect to occupy. It can do the same for you.

This school has never guaranteed positions for its graduates, but practically every graduate has obtained immediate employment as is advancing rapidly. The demand for our graduates far exceeds the supply, and we honestly believe that every student who enrolls here will be able to obtain, with our assistance, immediate employment upon graduation.

WARNING!—"Don't miss the boat." The greatest opportunity in your lifetime exists today! There never was such an opportunity in aviation for you; there may never be another. A position awaits you. Insure for yourself a steady income and independence for life. DON'T FOLLOW—LEAD! Send in your enrollment before you "miss the boat."



THIS TOWER OVERLOOKS AVIATION'S MOST DISTINGUISHED SCHOOL OF AERONAUTICS

Offering specialized and proven training in AERONAUTICAL ENGINEERING & MASTER MECHANICS

No Flying Involved

CURTISS WRIGHT TECHNICAL INSTITUTE

GRAND CENTRAL AIR TERMINAL 1229 AIRWAY GLENDALE (LOS ANGELES) CALIF

UNDER PERSONAL SUPERVISION OF MAJOR C. C. MOSELEY, OWNER, SINCE ITS ESTABLISHMENT IN 1929

Contractor to the U. S. Army Air Corps

BE WISE—PROTECT YOUR FUTURE

MAIL TODAY • DON'T DELAY

WITHOUT COST OR OBLIGATING SEND ME FULL INFORMATION AND CATALOG ON THE COURSE CHECKED BELOW

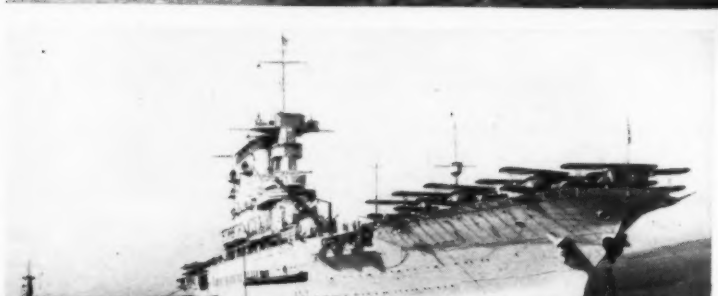
- ☐ AERONAUTICAL ENGINEERING COURSE
- ☐ MASTER AVIATION MECHANIC COURSE
- ☐ SPECIALIZED ENGINE COURSE
- ☐ SPECIALIZED AIRPLANE COURSE
- ☐ SPECIALIZED AIRCRAFT WELDING COURSE
- ☐ POST GRADUATE AERONAUTICAL ENGINEERING COURSE
- ☐ SPECIALIZED AIRCRAFT SHEET METAL COURSE
- ☐ AERONAUTICAL DRAFTING COURSE, HOME STUDY
- ☐ AIRCRAFT BLUE PRINT READING COURSE, HOME STUDY

NAME _____

ADDRESS _____

CITY _____ STATE _____ M-3

PLANE VS BATTLESHIP



Operating in conjunction with the fleet, planes serve as long-range eyes and artillery and protect the vulnerable battleship from bombers and torpedoes

Why battleships alone cannot operate successfully when attacked from the air

by **ROBERT McLARREN**

TODAY, for the first time in all history, air power has come into the full meaning of the word; has come to be a potent factor in the evaluation of a nation's fighting strength. Most certainly there were airplanes in World War I and assuredly they played a vital role in that bitter, four-year struggle. But there was no such conception of air power as we know it today—on a comparable basis with land power and sea power.

However, much of the military airplane's fame has been spread by zealous supporters rather than by its actual accomplishments, and so much verbose rubbish has been written by laymen on the subject of air power in the past that it

has become difficult to convince the average person that the military airplane has not already, or will shortly, replace every other military weapon.

Air power proponents insist the modern military airplane can destroy the enemy's productive centers and drive its shipping from the seas alone and unaided. Others say the military airplane cannot do this either unaided or with all possible sea and land cooperation. Certainly these extreme, opposing viewpoints demand an analysis particularly in light of experience gained through use of air power in the past three years.

Into the strength of a nation's defenses must go three staunch blocks: an army, a navy and an air force. Without one, the other two are impotent against an enemy using all three. Thrown out against the enemy in a reckless effort to crush by sheer force his offense, each doing its own job in its own way, these three arms are similarily useless. But in the hands of a capable staff, fully aware of capacities and limitations of each of these powers, directing the offense with a calculated inter-play of strength and science and drawing the maximum of tactical efficiency from each, these three units can be welded into an unbeatable combination.

Hitler, in a crushing, unmerciful manner, has proved that an airplane-army combination with sufficient numerical superiority is unbeatable on land. Japan, in less than one hour, proved in a like manner that a navy lacking air support is little more than useless.

A merging of strength and a covering of weakness is, then, the secret of military victories. Our military leaders, together with those of our allies, are mastering this formula and with it will win through to final and complete victory. And air power may even play the leading role in this, the second War for Freedom.

The use of the airplane against ground objectives has been discussed all too completely in newspapers, but it has been shown America need have little fear of an air-borne invasion. But the War in the Pacific has become an air-naval war and it is of immediate value to discuss the subject of plane vs. battleship in light of past experience, known facts and probable future relations.

Why the battleship? Because it is the only naval vessel capable of affording the maximum protection from air attack, because it carries the most powerful anti-aircraft batteries of any ship and because it is the embodiment of sea power: the basic unit of all fleets. Cruisers, destroyers, submarines and motor torpedo boats are no match for bombers or torpedo planes and have little defense against them other than AA batteries, speed, depth and maneuverability in each respective case.

What are inherent weaknesses in the airplane and the battleship? What failings of each must be covered and protected by the other's strengths? The airplane is the most vulnerable military weapon and has extremely short "staying" power. Thus, it is easy to destroy.

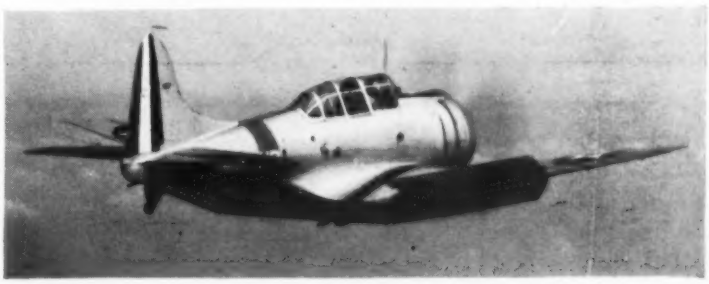
The battleship has a very slow speed, has poor maneuverability and is both costly and time-taking to build. Although

(Continued on page 59)

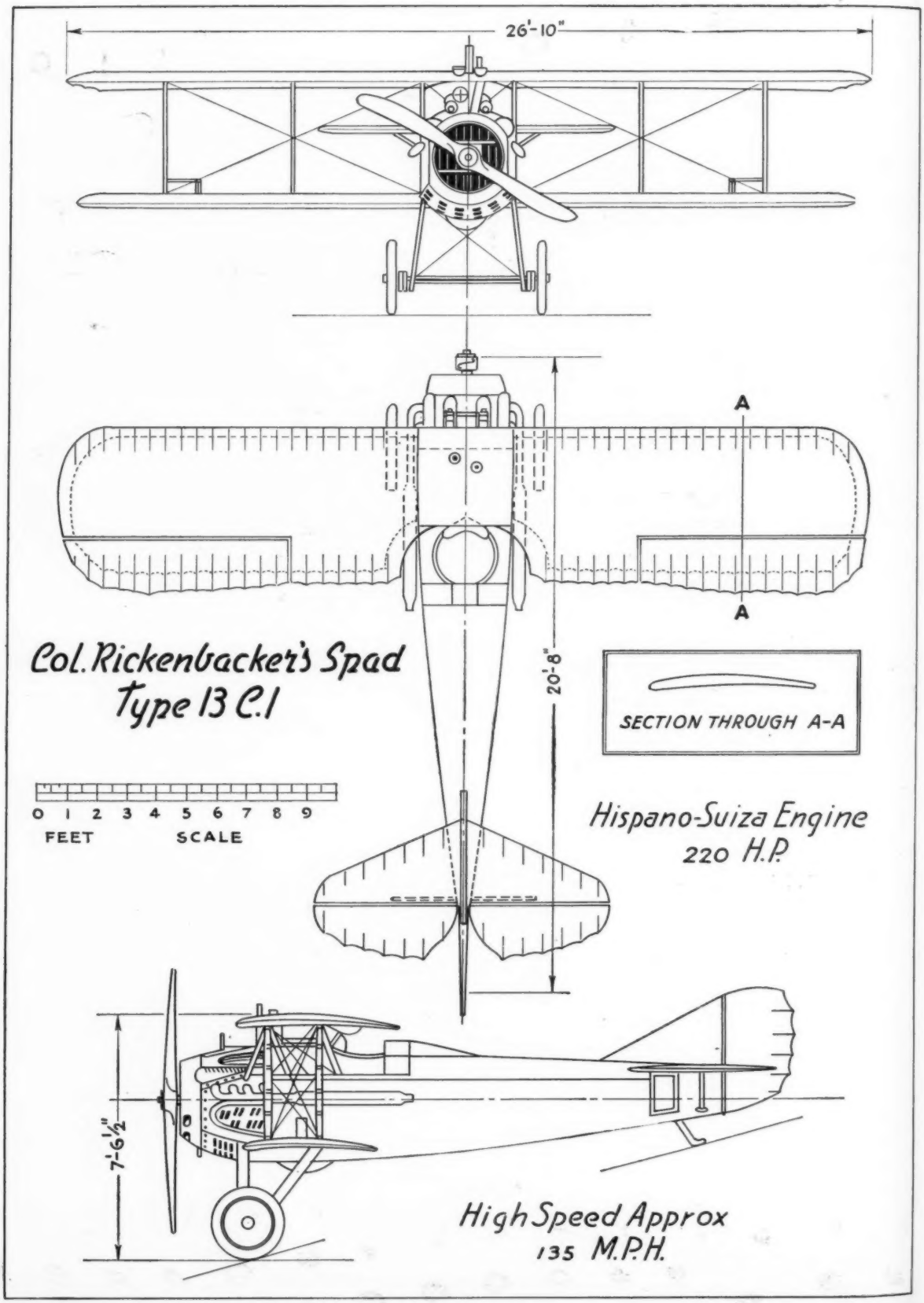
The Vought 2000 hp. Navy super high-speed pursuit plane: it has no equal in speed, climb or altitude

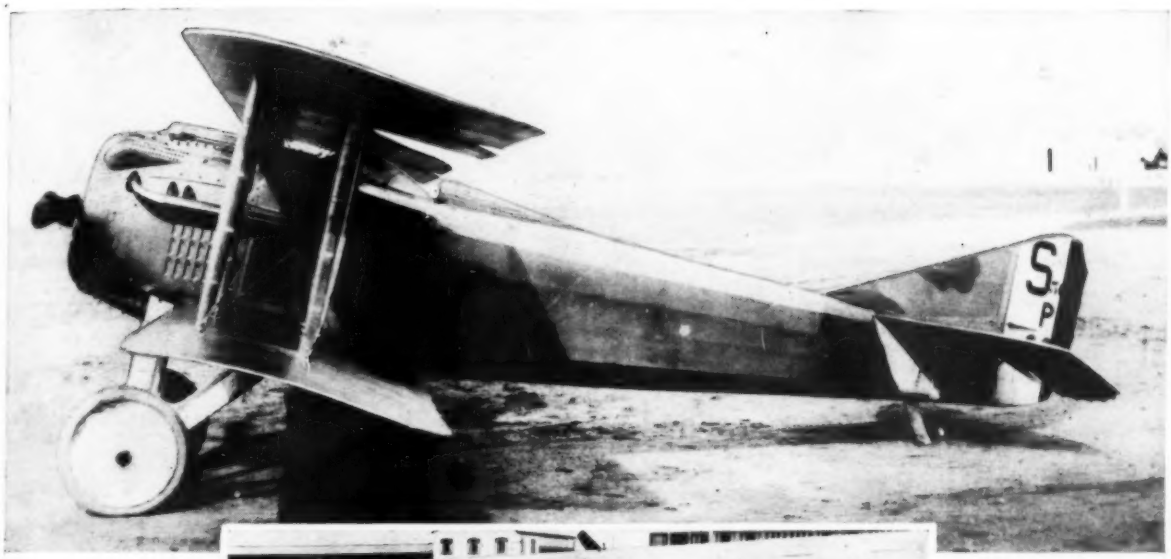
A fleet is at the mercy of planes like this Douglas B-19

Navy torpedo planes, the battleship's most dreaded winged foe

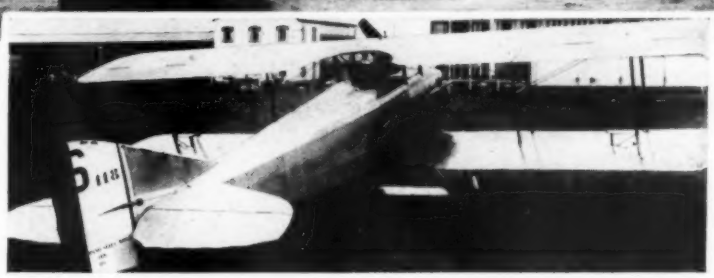


(Above) Douglas dive-bomber with double flaps open ready to dive.
(Below) Navy's most dependable plane, Consolidated patrol-bomber, now becomes amphibious


26'-10"
A
A
20'-8"
SECTION THROUGH A-A
Col. Rickenbacker's Spad
Type 13 C.1
0 1 2 3 4 5 6 7 8 9
FEET
SCALE
Hispano-Suiza Engine
220 H.P.
7'-6½"
High Speed Approx
135 M.P.H.



(Right) The Spad with 220 hp. Hispano-Suiza engine; speed 135 m.p.h.



Type of Spad used by the French Ace, Guynemer

MODELING THE WORLD WAR SPAD

How you can build a miniature scale model of the famous World War I fighter

by

ALAN F. KITCHELL

THIS article on famous fighting planes of the First World War is dedicated primarily to a new generation of model builders who are "cutting their first teeth" on the fascinating subject of war flying, and who are handicapped in their building program by lack of plans and information. Also, to those who have been interested in building World War "scales" since MODEL AIRPLANE NEWS first published plans a decade ago. And lastly, but not least, to those gallant young men who flew the planes during the "Big Scrap," which for them was a fight to end wars for all time!

Famous in fact and fiction, the Spad is one of the most famous of the famed; the role it played gained for the stubby, fighting ship a permanent place in the aviator's hall of fame. Most of America's Aces flew to victory—and some to their death—in this French-designed plane that is today well known to all model builders. Perhaps some of the new generation have seen the Spad at the Smithsonian Institution in Washington, D. C., where it was placed on exhibition after the war. Pictures of the ship taken during World War I accompany this article.

The name "Spad" is derived from the initials of the French firm that built the plane (Societé pour Aviation et Dérives). The firm's history is interesting. Bleriot, the famous pioneer who made the first Channel flight, founded the firm in the war's first year. Originally, it had been formed on the "wreck" of the old Deperdussin company. M. L. Becherau, technical director of the old company, who later designed the "Spad," took over the company and subsequently joined hands with Bleriot.

From the accompanying three-way drawings and pictures we can see what an imposing fighting ship the Spad was. Rugged, sleek and sturdy—it looks every inch the superb fighting machine history records. One of the best types produced by the French during the war, its praises come from all sides; British and American fliers flew it and found it fast and maneuverable, and unbeatable in a dive. The Germans, too, found it an adversary of merit. As Tony Fokker wrote—it could dive "like a streamlined brick."

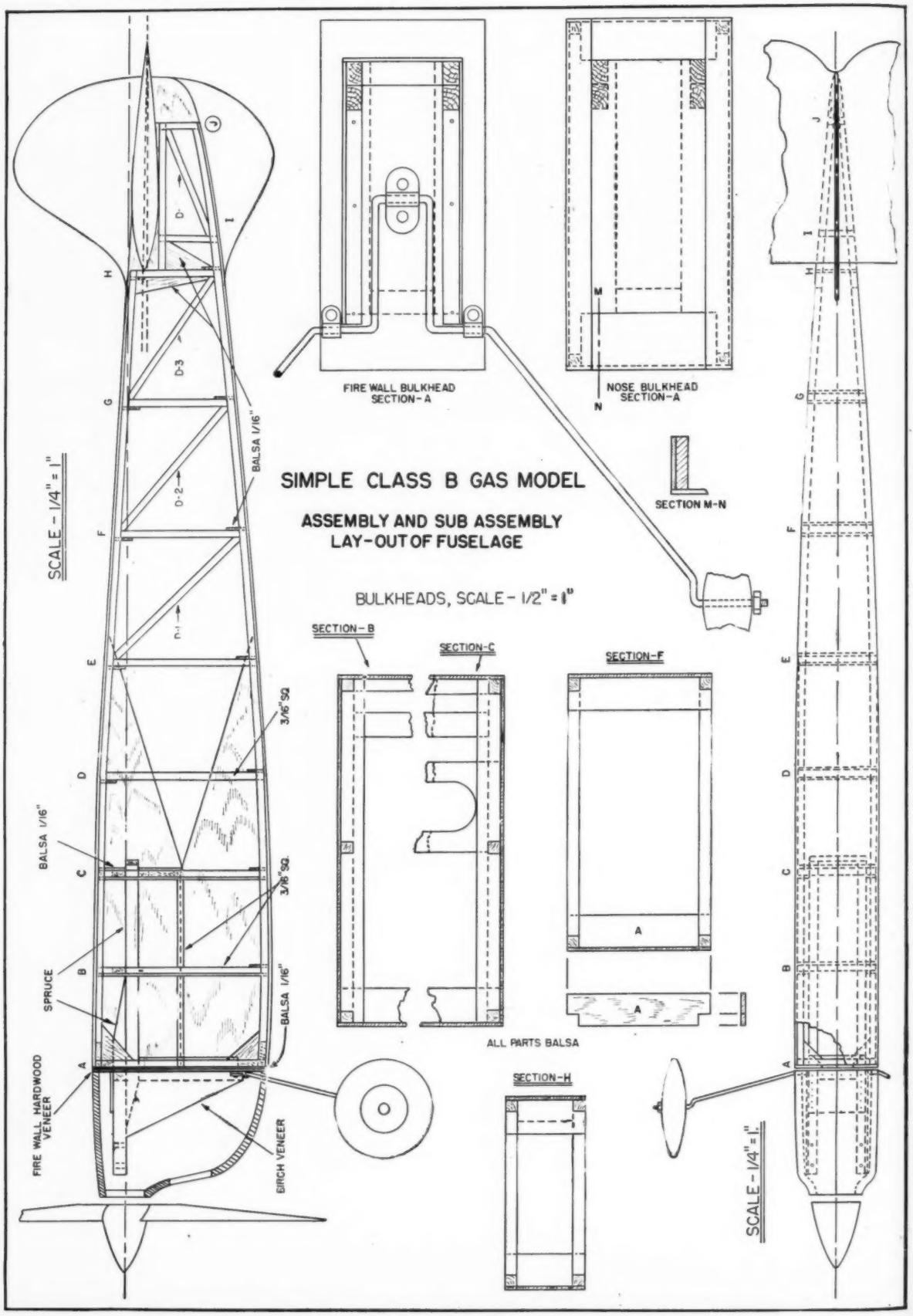
Victory in the flaming skies over France can be traced to the skill and daring of men like Guynemer, Rene Fonck, Rickenbacker, Luke and others who flew the Spad. It can also be traced to the designer's board—who constantly strove to bring out new types and keep ahead of the enemy. It was the vaunted Fokkers and Albatrosses that swept the skies and made vital the use of a faster and better plane for the Allies . . . so the Spad was designed to out-speed and out-maneuver the Fokker, doing its job well.

Perhaps in some ways it was inferior to the German plane, but Col. Eddie Rickenbacker writes in his book, "Fighting the Flying Circus," that it had "many accomplishments superior to the rival Fokkers." Staunch and strong, it was faster and could outdive other types.

Richthofen's 30th victory was a Spad. On March 24, 1917, he shot down and captured Lt. R. P. Baker of the 16th Squadron, R. F. C. It was the first Spad the "Red Knight" accounted for—but there were others, too, before Roy Brown ended his career a year later.

American pilots flew outmoded French Nieuports for many months before the Spad could be procured in any numbers, so it was not until August, 1918 (only a few months before the war ended), that

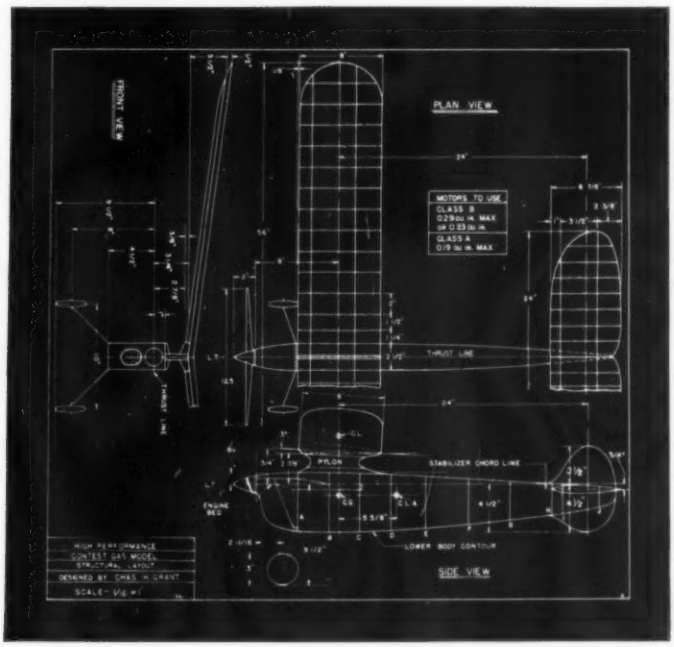
(Continued on page 44)


SIMPLE CLASS B GAS MODEL
ASSEMBLY AND SUB ASSEMBLY
LAY-OUT OF FUSELAGE
SCALE - 1/4" = 1"
BULKHEADS, SCALE - 1/2" = 1"
FIRE WALL BULKHEAD SECTION - A
NOSE BULKHEAD SECTION - A
SECTION M-N
SECTION - B
SECTION - C
SECTION - F
SECTION - H
ALL PARTS BALSA
BALSA 1/16"
3/16" SQ.
SPRUCE
FIRE WALL HARDWOOD VENEER
BIRCH VENEER
SCALE - 1/4" = 1"

MODEL DESIGNING SIMPLIFIED

Designing the structure of your gas model

by **CHARLES HAMPSON GRANT**



ARTICLE 16

AFTER the basic aerodynamic design of the gas model has been established, an outline drawing of it should be made to required proportions. Then the general structural design should be determined and approximate position of the parts indicated on the drawing as shown above. These steps were explained in article 15 of this series.

The next step is to design the structural details, determining how the framework is divided into detachable units, material and size of each individual part, and how all parts are held together.

These characteristics are influenced by three important considerations: first, convenience of transporting, handling and operation of the plane; second, ease of assembly and accuracy of form when completed; third, the stresses developed during takeoff, flight, landing or handling the ship.

First plan the structure so the tail unit, power unit, landing gear and wings are detachable. The tail unit includes stabilizer and fin and can be held rigidly in place on the rear of the fuselage by rubber bands engaging hooks on stabilizer and fuselage. This may then be quickly and easily removed for transportation or storage.

It is even more important to design the motor mount and landing gear as a detachable unit. The entire powerplant including motor, tank, batteries, coil and condenser should be mounted together on a removable frame. This as well as the landing gear may be attached together or to a firewall bulkhead held as a unit rigidly to the nose of the fuselage, but which may be detached when necessary (shown in the detail plans, opposite page). This makes it convenient to replace batteries, adjust the engine or make repairs. Also one engine may be quickly replaced with another mounted in similar manner.

It is easy to make the wings detachable in this type of ship. Here a pylon on the top of the fuselage supports the wing in a parasol position (see layout drawing). A detachable wing not only makes the plane easy to transport but may be more easily adjusted to obtain proper flight balance. Make the pylon as a separate unit; this should rest upon the top of the fuselage and can be attached to it by rubber bands. The pylon then can be moved forward and back, adjusting the wing position relative to the c.g.

The wing rests on the top of the pylon and is fastened to it with another rubber strap, passing over the wing from front to rear and hooked over two hardwood horns extending outward from the pylon (see next installment). Here we have a most convenient arrangement: not only can the wing be adjusted or removed but in crashes the wing, being flexibly mounted, will not be torn loose, thus breakage is reduced.

The second step is to design the details of these sub-assemblies. In this article only the structural design of the fuselage will be considered. Structural details are influenced by two factors mentioned previously; namely, ease of assembly and the stresses developed. The structure should be as simple as possible; however very often structures that look simple are in fact very difficult to assemble and often impossible to build accurately according to plan. It is most important that when the structure is completed it conform precisely to the plans and not be distorted or warped, embodying all the correct angles as for instance the angle between the stabilizer and the wing. Usually simple assembly operations make it easy to build a model as well as assemble the structure.

Let us look at our basic outline and see what is necessary to design a simple fuselage. The easiest method of assembly is to make the two vertical sides and then join them together at the top and bottom. If the sides can be made rigid so no warp results during the assembly, the tail surfaces will have the proper angles and will not be twisted.

The design of the vertical side should embody longerons and vertical struts. It is not exactly of symmetrical shape, therefore a structure composed only of these members would warp when released from the assembly jig. Consequently diagonals or sheet balsa must be applied to hold the structure in proper form until assembled. A sheet balsa covering over the forward end, under the wing, will not only hold the body side rigidly but will give added strength at that point where the stresses are greatest, thus serving two purposes.

The balsa may cover the whole side from nose to tail, however the tail of models should always be kept as light as possible. Weight can be reduced therefore by extending the balsa sheet half-way along the fuselage and covering the rear portion with paper (see detail plans).

The fuselage side at the rear of the balsa sheet can be held rigidly with diagonals as shown in the plans. It is best to cut a "V" in the balsa sheet, also shown. This reduces the internal stress gradually and not suddenly at one point of the frame thereby making a very much more elastic and stronger structure.

When designed in this manner the two sides may be assembled together by horizontal cross pieces top and bottom at each panel point. By holding the fuselage rigidly at the nose and tail until the cement holding the cross pieces dries, no warping will result.

The simplest form of nose unit is composed of two engine bearers extending rearward into the fuselage, long enough to

(Continued on page 51)

Copyright 1942 by Charles Hampson Grant.

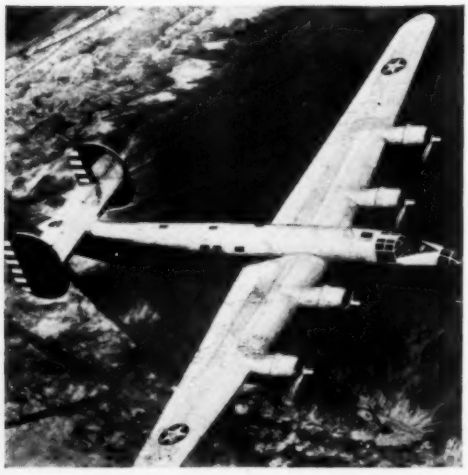
FRONTIERS

Aviation Headliners

Planes and warships of the Dutch Navy that have operated so effectively against the Japanese, sinking many of their transports.

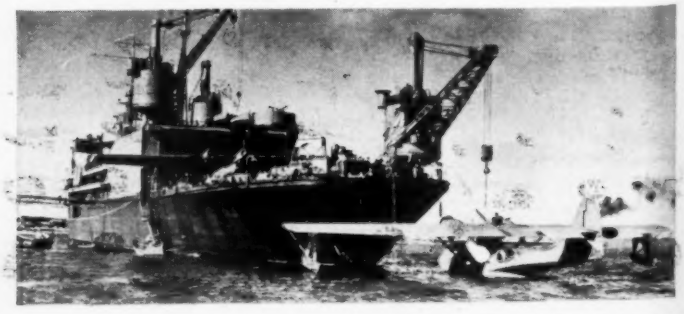
(Above) The world's most powerful dive bomber, Curtiss XSB2C-1 protects the fleet.

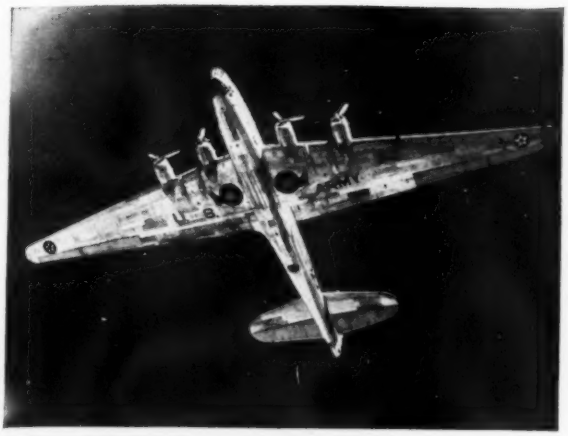
(Below) Consolidated heavy long distance bomber now in mass production.

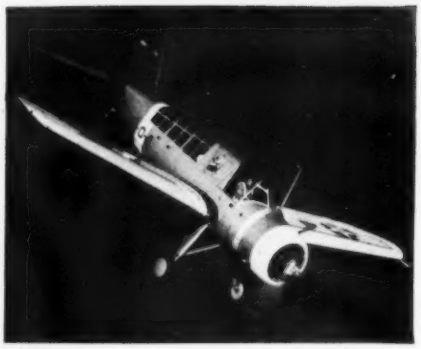


The new Brewster Buccaneer long-range dive bomber; just the medicine for the Jap Navy.

(Above) Land based version of the Curtiss XSO3C-1 scout observation plane. (Below) An important ship when no bases are available: a seaplane tender at a secret rendezvous.

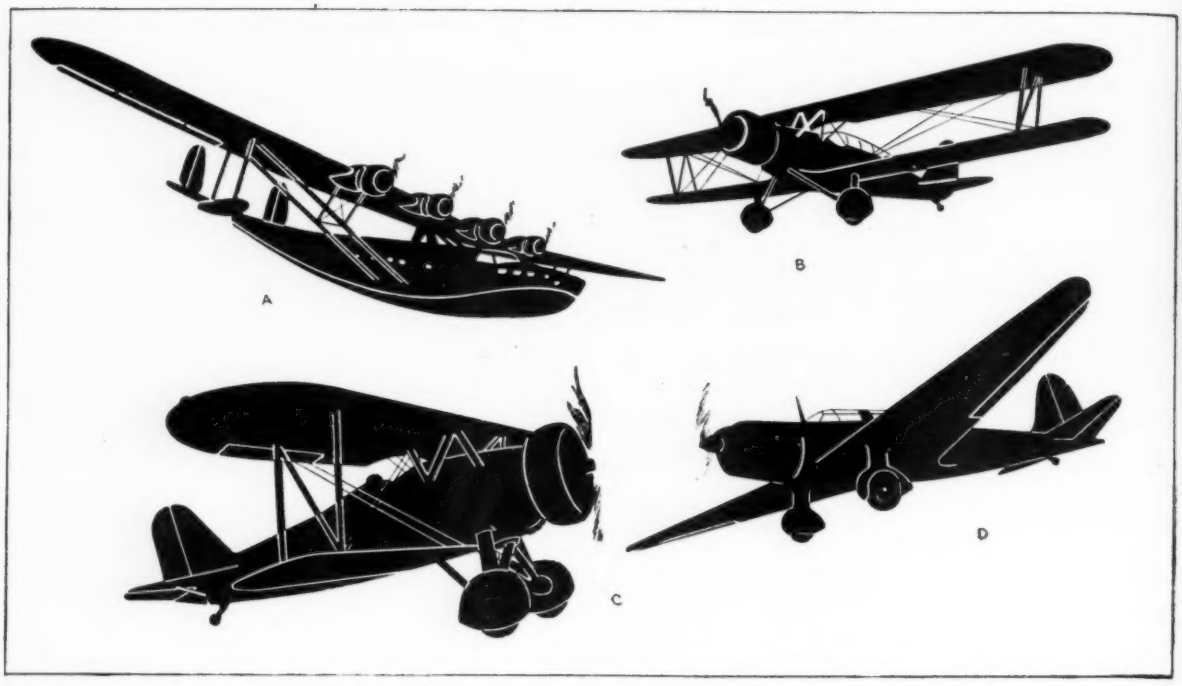






(Upper left) Uncle Sam's huge 82 ton long range B-19 bomber; look out Tokyo. (Upper right) Curtiss U.S. Army transport. It may carry troops abroad. (Left) Vought - Sikorsky OS2U-1, shipboard observation scout and "fire" spotter for ship's big guns. (Right) A flock of Ryan PT-21, 132 hp. Army basic trainers in formation.

(Above left) Martin PBM-1, Navy 40 ton patrol bomber—it's death to submarines. (Above right) Martin B-26, world's fastest medium bomber, now in mass production. (Below) World's most powerful pursuit plane, 2000 hp. Republic P-47, "Thunderbolt:" note its tremendous size.



SKY SCOUTS— KNOW YOUR PLANES!

Join this Airplane Spotters League and learn how to "spot" enemy aircraft

EVERY red-blooded American wishes to help his country in this crucial moment. Many model builders have been at a loss to know exactly what they can do. Most of them have keen eyesight and can familiarize themselves quickly with different types of planes, thus making excellent spotters.

MODEL AIRPLANE NEWS therefore has organized the Sky Scouts, a national organization dedicated to the purpose of spotting enemy aircraft. Each month silhouettes, pictures or plans of Japanese, German or Italian aircraft will be printed in the Sky Scouts column.

This will serve as a monthly lesson for each enrolled member, helping him to become familiar with the distinguishing characteristics of various enemy planes. This month's planes are as follows:

PLANE A—A long range Naval patrol bomber of unidentified manufacture greatly resembling the Sikorsky flying boats; apparently a product of the Japanese Naval Aircraft Factory. Reputed as having a 3,000 mile range, the craft undoubtedly compares in performance to our own four motor boats. Practically undistinguishable from the Sikorsky excepting for the "floating" type ailerons, no doubt a Germanic influence, this craft will prove extremely difficult to "spot."

PLANE B—The Nakajima 96, a Naval Torpedo bomber used in close cooperation with the Nipponese Navy units and operable from aircraft carriers. Sufficiently formidable in fire power and armament although sluggish in appearance, the craft assumes an important role in Japan's war efforts. Easier to "spot" than many of the other Japanese fighters because of its somewhat "dated" lines, the Nakajima 96's appear to be much like a Hollywood Production. In appearance it possesses a little of everything of '30 vintage.

PLANE C—The Nakajima 95, single seat shipboard fighter. Capable of some 200 miles per hour, the craft is believed to be a "souped up" version of the Nakajima 90 originally powered with 450 h.p. Japanese manufactured Bristol "Jupiter," renamed the "Hotobuki." In appearance, the craft is identical to the Boeing P-12 excepting for the wheel pants which are typically "British." Lacking in firepower, and easily recognizable, the tiny Navy fighter will undoubtedly find it "tough sledding" after Uncle Sam's lads spot it.

PLANE D—The Mitsubishi 97, a light bomber serving the Mikado's Army efficiently and effectively. In appearance it resembles the Northrop A-17 with semi-enclosed type wheel pants similar to those first adopted by the Curtiss Hawks of past years. It is powered by a single, liquid cooled engine of unknown make and horse power. Its somewhat blunt shaped nose, slender cockpit enclosure and strikingly outmodish undercarriage should make it readily recognizable to all Sky Scouts and Aircraft Spotters.

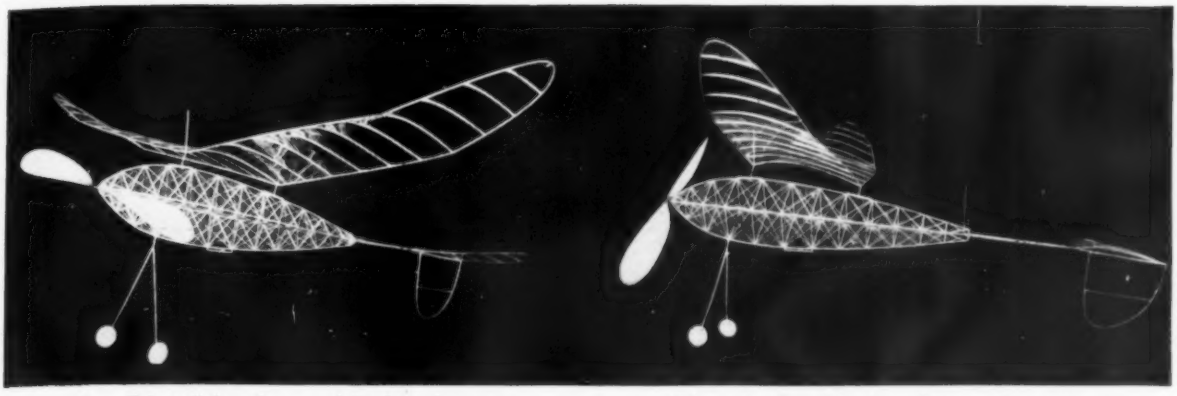
Send To: Model Airplane News, 551 Fifth Ave., New York, N. Y. 2

I Want to Become a Sky Scout!

Name . . . . . .

Address . . . . . .

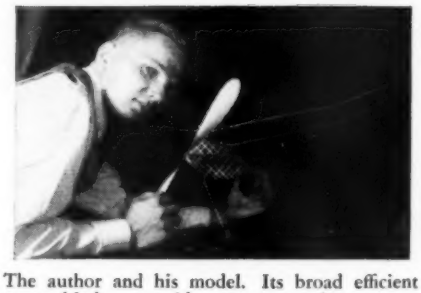
City . . . . . **State** . . . . . .



An efficient light wing, carefully braced, supports the fuselage of this super model

Diagonal paper fuselage braces give great rigidity yet low weight

NATIONAL INDOOR FUSELAGE WINNER



The author and his model. Its broad efficient prop blades provide great tractive power

How to build the 1941 Champion senior indoor fuselage model—first place winner in eight contests

by STANLEY STANWICK

BEFORE being flown at the 1941 Nationals, this model established a national record and won eight contests. In fact, it won first place in every contest entered, including the New England Championships, proving itself stable and reliable; characteristics highly desirable on indoor designs.

This design is the third of a series. It was found that by having cleaner fuselage, higher wing, thinner airfoil and lighter construction (making possible higher weight/power ratio), duration showed a definite increase. In general, the model follows principles established by outstanding contest winners and record holders with many added features making for ease in adjusting and flying.

Building this model should not be difficult for anyone with some experience in indoor building; this plane is a good start for newcomers who have little practical experience, as it utilizes practically every little "trick" known to indoor experts. If the program or system described here is followed to the letter, the builder will have no trouble in duplicating the job and duration.

BUILDING PROGRAM: First build the wing and tail surfaces, including covering, and put them away in a dustless place to "age." Second, construct and cover the fuselage. Third, finish the propeller. The propeller is a very important part of the model: it took the writer three evenings or about ten hours to carve it, so this design is not one to be tried as the last minute rush, it is a design which will return flights in proportion to care and time expended. Above all, try to follow the weight schedule.

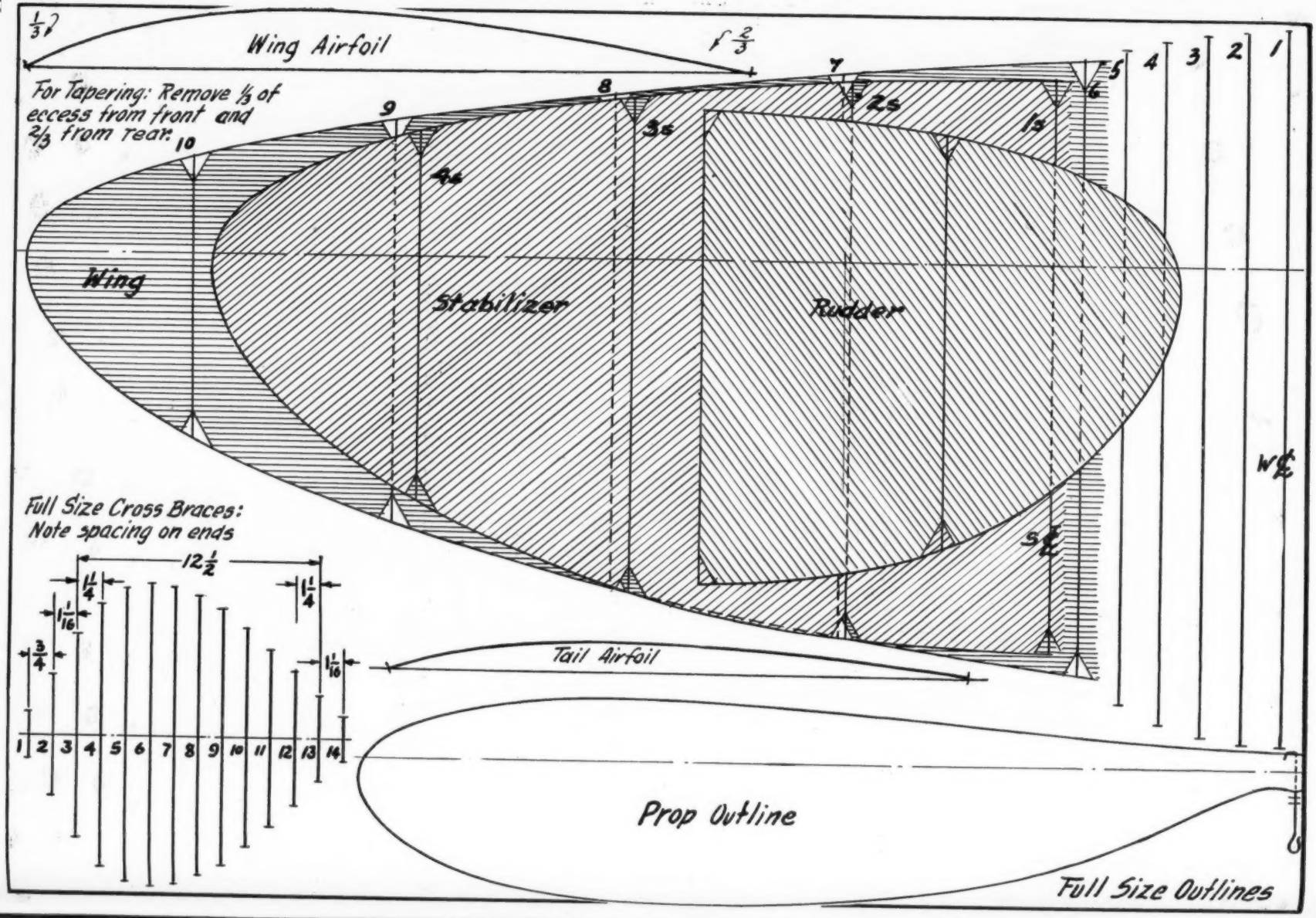
Draw full size templates for wing, stabilizer and rudder. Note that only the most important portion of the wing is shown. Balance by using full size rib dimensions, between No. 6 and No. 1. After making half the stabilizer and wing, make duplicates to obtain complete wing and stabilizer templates. The fuselage side may also be drawn now. Use the spacing dimensions given on drawing and full size uprights, noting that inside dimensions are given for the latter.

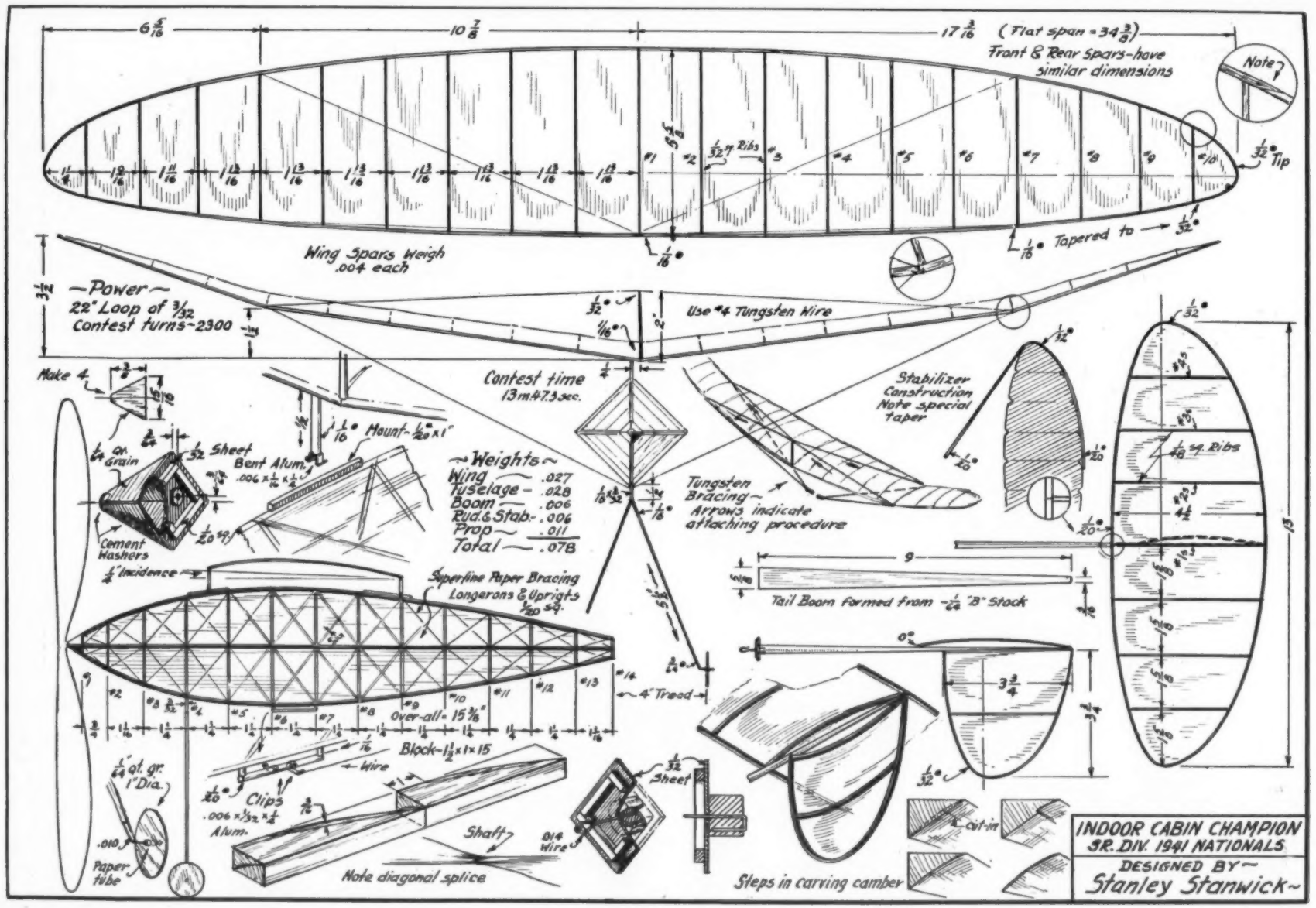
By using templates the most difficult part of making elliptical wings is overcome, and they may be used over and over again. Note "V" cuts to prevent cement from sticking template to the spars and ribs.

MAKING THE WING: Spars are cut from 1/16" indoor stock. Note the taper from the second dihedral break to the tip, done by sanding the sheet to taper from 1/16" to 1/32" for distance shown before stripping. To complete tapering, cut with a sharp razor blade, steel edge guided, 1/16" wide strips up to the break mark, and then angle the edge so the rest of the strip tapers to 1/32" width. Carefully round corners with fine sandpaper and check for weight. All four spars should match in weight and curvature. Light-load each spar end and then load the tips with identical weights to check for uniformity. Cut ribs from 1/32" "C" or quarter-grained stock. Paste template to a strip of aluminum to aid in cutting the ribs.

Fix template to a flat board. Moisten the spars and lay them along the edge, holding them in place with clamps made from odd pieces of balsa and pins. This will keep the pins from crushing the spars. Cement spars together at the center and while they are drying, make the tips. Fashion a small duplicate template of the tip. Wet 1/32" round strip and roll it around the template. Be sure to keep a constant pull on the strip while bending, then hold in place with pins. Put into an oven for about ten minutes. Note how the tips are joined to the spars to obtain a smooth and continuous outline. Ribs are tapered by cutting off the excess as follows: Take off 1/3 of the surplus from the leading edge, and balance from the trailing edge. Let the wing assembly set

(Continued on page 48)


1/3
Wing Airfoil
f 2/3
For Tapering: Remove 1/3 of eccess from front and 2/3 from rear.
9
8
7
6
5
4
3
2
1
10
4s
3s
2s
1s
Wing
Stabilizer
Rudder
W.L.
S.L.
Full Size Cross Braces:
Note spacing on ends
12 1/2
1 1/4
1 1/16
3/4
1 1/16
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Tail Airfoil
Prop Outline
Full Size Outlines



Full Size Outlines

(Above) 1. Contest official Charlie Bristol can build and fly 'em too

2. An auto starter and link of hose save this modeler hours of prop spinning

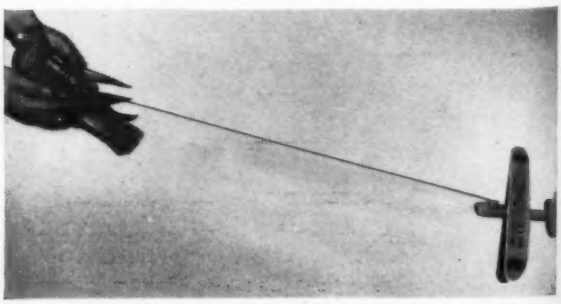
3. Joe McCown's 30 in. flying scale Fairchild Ranger

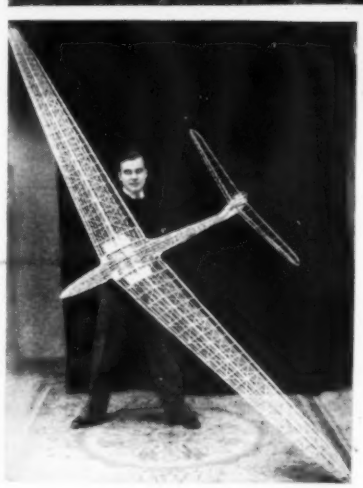
4. A flying scale Hurricane built by Charles Warren

5. Donald Snook takes "time out" at the Bristol, Va. contest

6. Ken and Casey Holm with part of their sky fleet

(Above 7. Duane Carpenter and Kaye Dahlgreen with winning U-controlplanes. (Below) 8. Francis Wilcoxon's homing pigeon tows a glider attached with a harness





(Above) 9. Down on the farm Fred White "brushes up" on his flying. (Left) 10. Can you estimate the hours of careful work in this beautiful glider, by Salvador Bagüena? (Below) 11. Stuart Richmond and his model Messerschmitt built from 10c kit

AIR WAYS

News of models, builders and activities from all parts of the world

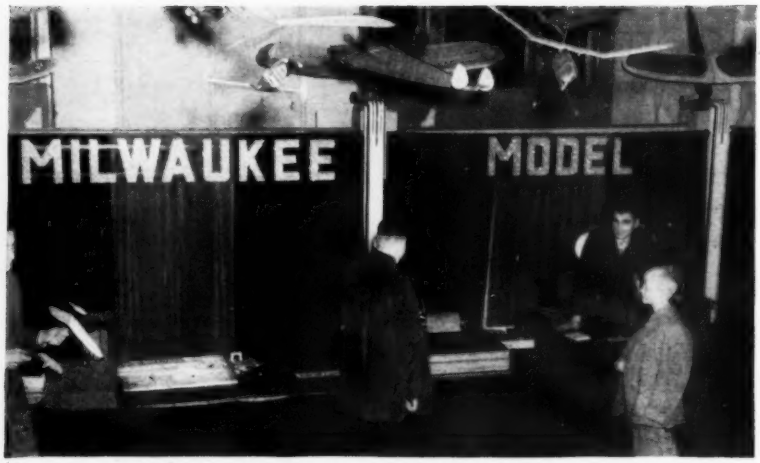
THE biggest event affecting model aviation outside the war itself, is the combination of Air Youth of America with the Academy of Model Aeronautics, under the National Aeronautic Association organization.

The thoughts of many model builders have been very confused as to the real significance of this change. Some have looked upon it with misgivings, but the majority have accepted it as a step forward. We believe the latter is most significant of the situation, and we would like to "throw a little light" on its real meaning and advantages. In the past the greatest need in training American youth through the medium of model aeronautics has been teachers and leaders with a thorough understanding of model aeronautics and its place in our educational and defense system.

There are plenty of young men who are super-experts at the game; this deterred older people with limited knowledge from undertaking the task of instructing boys who knew more than they did about the art. Also there were very few older people thoroughly familiar with its benefits and with capacity and position to organize model builders on a national basis.

In other words, the great need has been teachers and leaders familiar with organizational problems. The A.M.A. has been functioning in an enviable manner; regulating activities and supplying vital scientific information. However it lacked cooperation of influential executives in a position to organize model aviation nationally. But directors and executives of A.Y.A. were entirely familiar with organization problems, were men of influence having as well the patriotic desire to educate young America in aviation. They interested many leaders in clubs and public schools organizing and instructing them throughout the country to carry on successful model clubs. They did a splendid job but the organization as a whole was lacking in technical knowledge relative to model aeronautics.

Each of these two organizations possessed virtues of great benefit to air modelers provided they could be coordinated under one functional head. These leaders recognized this fact and the result of a



12. Milwaukee Model Club exhibition booth "deals out" aviation knowledge to the public

joint conference was to combine their forces under the banner of the N.A.A.

In effect former advisors and executives of air youth of America will function under the N.A.A. to organize model aeronautics nationally, carry on an educational program among teachers, leaders, schools and other individuals and organizations who might participate in this great sport as an educational medium. This will be helpful, will serve to extend the field of model aviation and bring to adults the realization of its importance to the future welfare of our country—of which in the past they have been comparatively blind.

For 20 years the model builder has been trying to "sell" modeling to older people and at least we have arrived at the moment when we believe the objective has been reached. This should be cause for the greatest joy in the model field.

The A.M.A. will function as usual—directing and facilitating all model activities, making rules, enrolling members and disseminating information. These functions should be carried on in even greater efficiency since the Academy will now be able to function without many promotional considerations. Unquestionably there are many other advantages to the new setup and we believe the model builders can look forward to great expansion of activity with the cooperation and help of many adult and wise heads who now realize the great importance of aeronautical education through the medium of motdel airplanes as a scientific instrument; not merely as a "play thing."

Many of our expert modelers are now in the Army, using the valuable information obtained in their hobby to create wings for Uncle Sam. However thousands of others still keep model activities humming; for instance, look at picture 1. Here you see Mr. Charles Bristol of Cheyenne, Wyo., an official at the recent Cheyenne contest, flying his own plane which he brought to the contest. Being an official does not keep him from flying. Though years over 21, he says that still the greatest thrill in his life is getting one of his little ships into the air. This contest was held at the Greeley Airport. Considering that this is very sparsely settled country, the 50 contestants assembled is indicative of intense interest in the sport. Also here models must take off at an altitude of several thousand feet, making flying conditions more difficult. Apparently adversity merely breeds the will to win, for members of this club "clean up" at many contests throughout the West.

In picture 9 you see some activity near Port Arthur, Texas. Fred White's plane takes off the flat Texas landscape to make a long flight. In the model game the country boy has the advantage of those in the city; he merely steps out his back door and releases his plane. Recently Texas has become very active in model flying, builders all over the state have organized into clubs and hold regular contests, drawing would-be prize winners from Louisiana and other adjoining states. Hundreds of builders in congested districts envy the Texas boys when they see the broad expanse of flat country shown in the picture.

Most model builders appreciate fine workmanship, so we present picture 10, sent to us by Salvador Bagnena of Rambla Volart No. 79, Barcelona, Spain, shown in the picture holding his large span glider. We have little data concerning this ship, however close scrutiny will divulge considerable information regarding its structure and the remarkable craftsmanship of its builder. We would certainly like to have the thrill of seeing this plane take to the air; perhaps Mr. Bagnena has a flight picture which he will send.

One of the greatest unsolved problems in model aviation—at least unsolved up to this moment—is starting engines. Modelers usually return from contest all worn out from an afternoon of spinning props. The problem of balky engines as yet has not been solved; but engines, balky or not, can be started quite easily with the apparatus shown in picture 2. Here the modeler has attached an automobile starter to his motor, clip connected to the battery and switch operated by foot. A link of rubber hose fastened to the starter shaft and engaged at the other end to fit around the propeller hub serves as a connected link between motor and plane. By pressing the starter button the prop is spun over at about 1700 r.p.m. This exceeds by far the rotational velocity possible by the most expert human prop-spinner and ends the most discomforting effects of having the propeller blade catch up with one's fingers.

All gas model fliers would do well to rig up similar apparatus. It is not necessary to attach the motor directly to the car battery; if desired a special battery may be used making it possible to transport, when at contests, the starting apparatus close to the runways.

Many unusual tricks have been tried in the model airplane game, but picture 8 shows a new one. Here a racing homing pigeon has been equipped with a light harness. To this is attached a small glider by rubber band. The bird takes off with the trailing glider and flies until tired, then returns to the loft. At the right moment an automatic trip on the bird's back releases the glider. Speed when in full flight is about 40 m.p.h. Francis Wilcoxon of Wheatridge, Colo., Box 335 is the originator of this unique idea.

Picture 11 shows Stuart Richmond of 61 Richmond Avenue, Worcester, Mass., with his neatly made Messerschmitt 109 fighter built from a 10c kit. The ship has a 16" wingspan with blue, green and silver decorations. Richmond is entering his ship in a contest which is soon to be held in Worcester.

In picture 3 you see a very fine flying scale Fairchild Ranger model. This was built by Joe McCown of 5237 Hemphill, Fort Worth, Texas. The plane has a 30" wingspan. It is shown with a scale prop, which may be replaced with a larger one for flying when desired.

Picture 5 shows Donald Snook of Bristol, Va., and his plane at a contest held sometime ago at Bristol. Charles Wampler, who sends the pictures, says: "Many contests are held throughout the state which are usually attended by as many as a thousand people." This prompts one to consider how air-minded people have become through the United States by watching model contests. On the West Coast meets are attended by as many os 8000 people. We believe credit is chiefly due to model fliers for making America airminded.

Picture 6 shows two model enthusiasts, Ken and Casey Holm of Roseau, Minn. with part of their gas model fleet incorporating several distinctive designs. The Holm boys use the motor-starter idea shown in the picture 4 with good effect; they have a portable battery attached to a "Model T" Ford starter.

Charles F. Warren is a student at Rensselaer of Polytechnic Inst., Troy, N.Y.; however in spite of his busy days he finds time to construct model planes. Picture 4 shows a Hawker Hurricane flying scale recently completed. It is built from plans in the September 1941 issue of MODEL AIRPLANE NEWS. A scale prop has been substituted for the flying one as the ship was built primarily for display. It is covered with Silkspan, finished in glossy red, all details are drawn in with India ink.

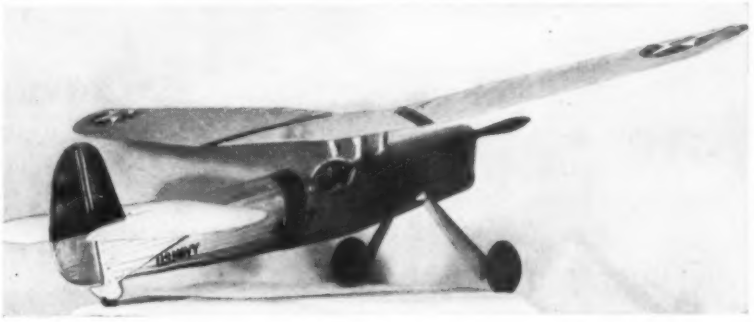
Recently the Seattle Gas Model Club sponsored a G-line or U-control contest, which was won by Duane Carpenter, shown at the left in picture 7 with his 20" wingspon Fireball powered with a Bunch Tiger engine. An average speed of 80 m.p.h. was "chalked up" for 3 laps, using a 60' line. Kaye Dahlgreen, shown at the right, flew his Fireball powered with an Ohlsson "23"

(Continued on page 52)

GAS UP THIS NAVY BOMBER

Looks, high performance, great stability are combined in this thrilling gas model

by **PETER WESTBURG**



(Top) Closeup of motor mount. Note simple, rigid construction. (Center) Realistic, yet proportioned for efficient, stable flight. (Above) Parasol wing gives climb and consistent flights

THE prototype of this model would come under the classification of a long-range scout bomber. Its long powerful engine, comparatively large wing and lengthy fuselage all give the impression of an airplane capable of cruising long distances and also being an effective striking arm for the U. S. Navy.

The model itself is a stable, sturdily built flier and performs very well with a 1/5 hp. engine. Not meant for contest work, it can be built lighter and become an extremely efficient contestant in model meets.

We tested this model a half dozen times before finally drawing the plans; each one was different from the preceding, and we expect to have many more flights. It flies like an airplane should; in great climbing circles and steady glides that are a revelation to watch. Built well, the model should last many seasons and be a continuous source of enjoyment to its owner.

READING THE PLANS: In general the plans are intended to convey a true picture of the various parts in their relation to each other. All locating dimensions can be derived from scaling the plans, and all sizes of longerons and other small parts will be given both in the manuscript and the plans. Note the stations of the fuselage are measured from zero point, which is the propellor hub rear face. The formers and bulkheads are drawn on a graph, each square of which equals a one-half-inch square on the full size model. To obtain the various formers and bulkheads, lay out a graph on scratch paper and draw in the station contours. The wing ribs are presented in the same manner. The rib stations are measured from the centerline, as are the rib stations of the stabilizer. The rudder and fin ribs are stationed from the top of the fin down.

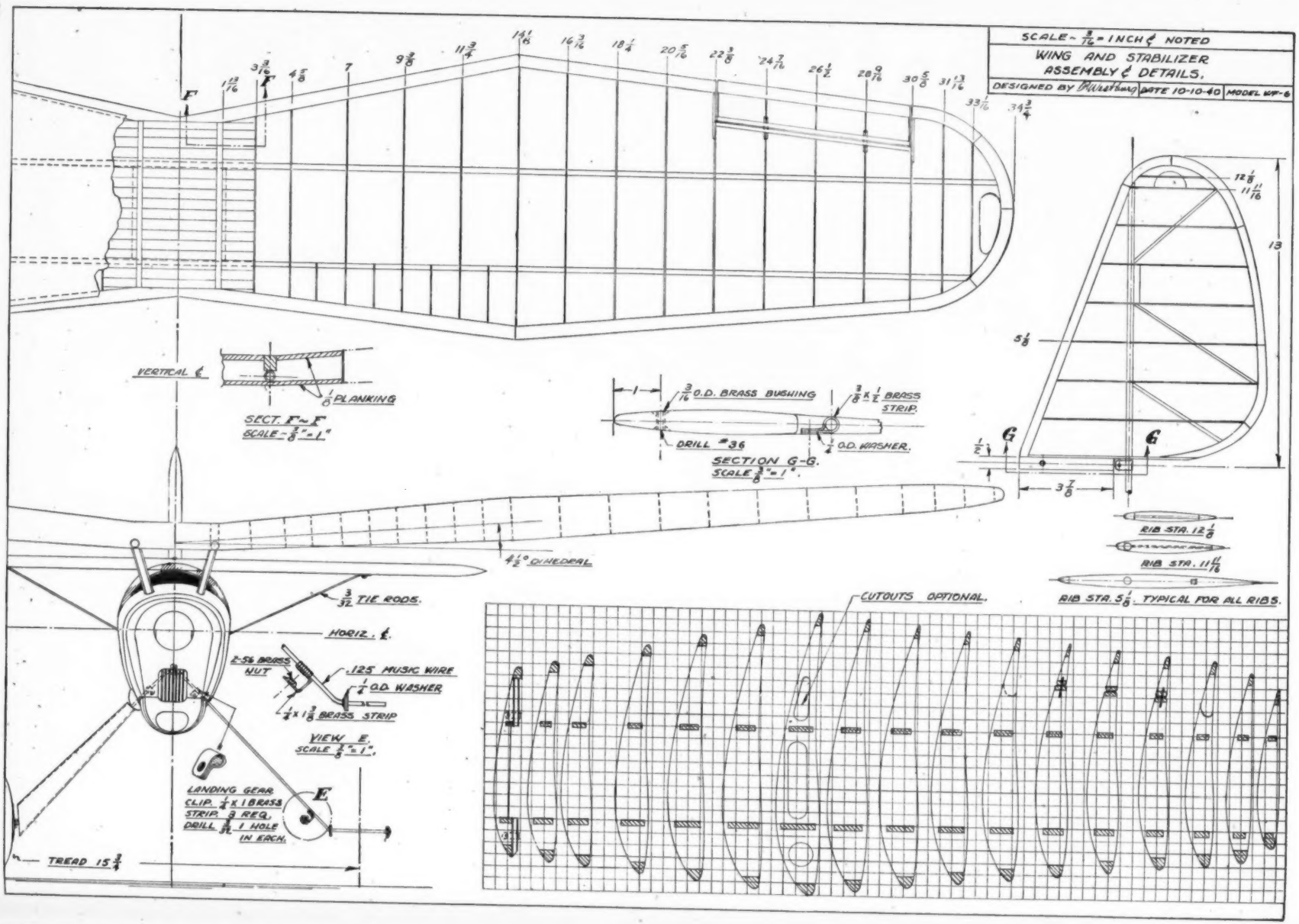
If this method seems rather hit and miss, remember that in working with balsa wood, very close tolerances cannot be held. Variations of 1/32", 1/16" or even 1/4" in some cases are satisfactory, and can hardly affect the model's aerodynamic qualities except in case of too great a variance in the wing airfoil section.

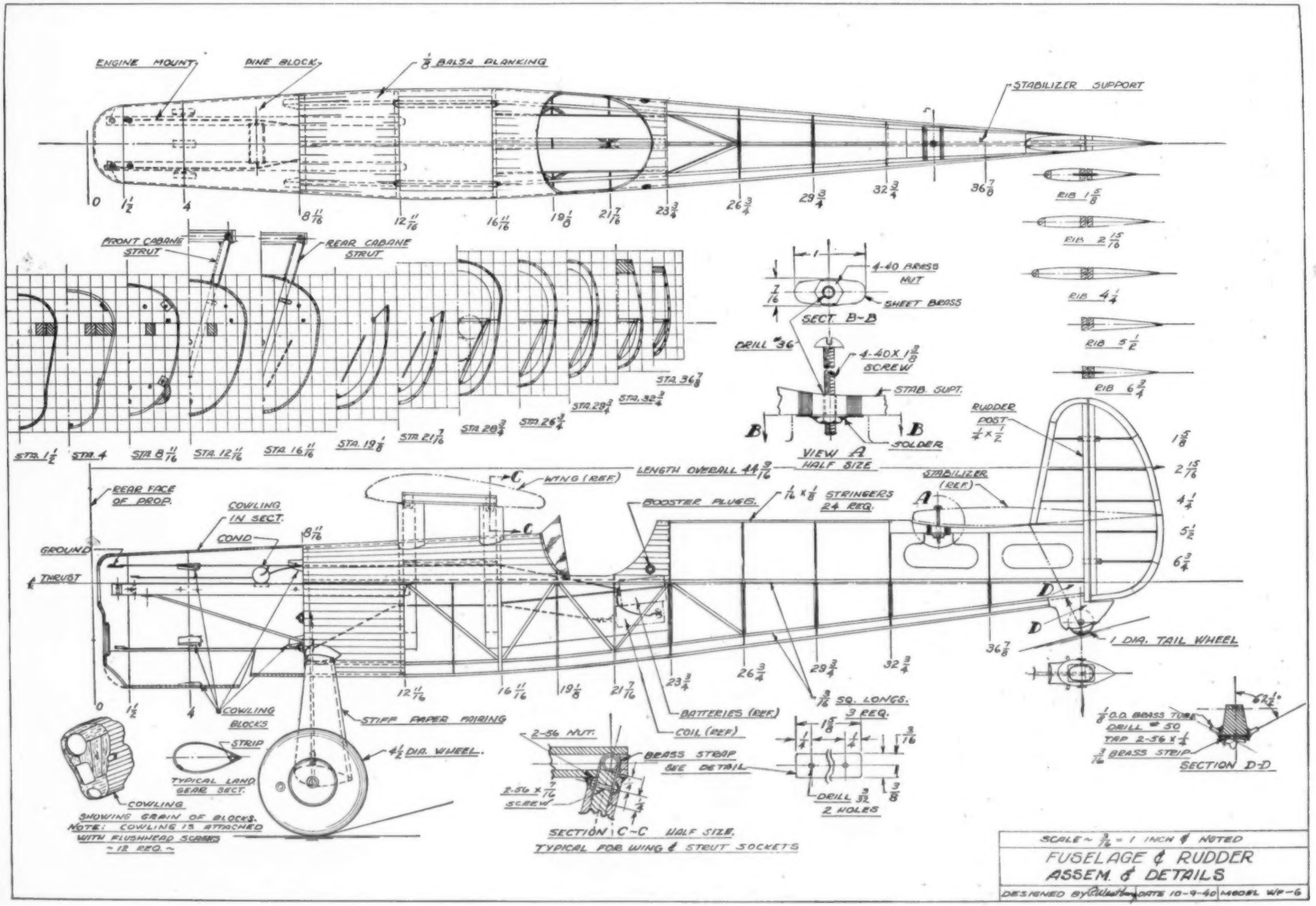
In presenting these plans it is taken for granted that you have already built at least one and probably two or three gas models. It should then be quite easy to grasp the construction of this model after a close examination of the plans and reading of the manuscript.

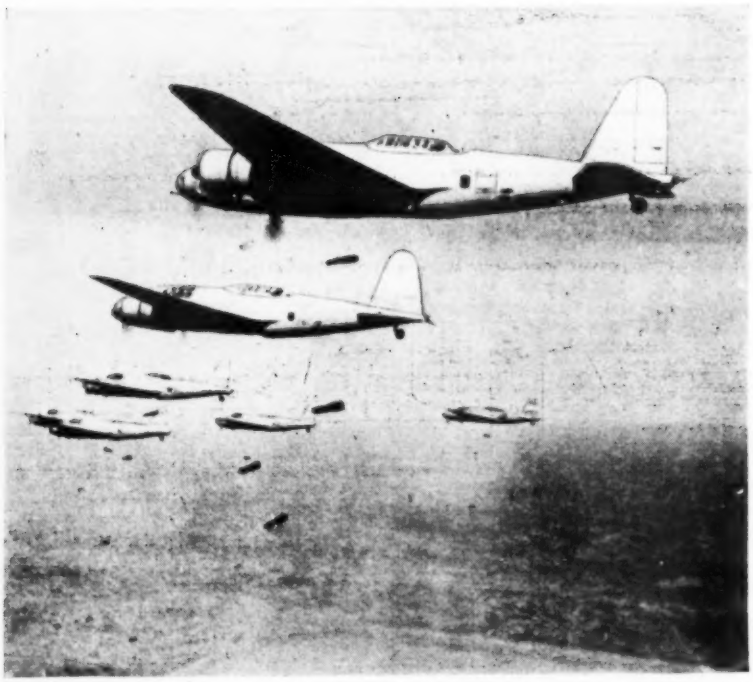
THE WING: Let us begin construction by building the wing first. It is in one piece, has two spars of hard balsa 1/4" thick, and approximately 67 inches long. If you splice them, use three pieces and do not splice in the wing center section. The ribs are all 1/16" hard balsa except the two center ribs, which are of white pine and 1/4" thick. Cut all the ribs out and make the cutouts for the spars and the lightening holes. All the ribs except the tip ones are assembled on the spars by slipping the spars into the holes. Handle a half wing at a time, and on a layout of the plan form, pin this assembly and line up the ribs as shown. When all but the tip and two center section ones have been cemented on, put in the center ribs. These have the front and rear 1/4" O.D. aluminum tubing sockets bolted to them. A strip of brass is soldered to the aluminum tube with aluminum solder and bolted as indicated in Section C-C. After these have been glued in, the trailing edges can be glued on. They are 1/2" wide and vary from 1/2" thick at the center section to 1/4" at the tips. Note here that a trimming tab is shown on the left wing panel. All trimming tab ribs and reinforcing gussets on the insides of Ribs 22 3/8 and 30 5/8 can be derived from the ribs on the graph.

The spars are 1/4" thick, heights and lengths are shown on the plans. Copper or brass strip hinges are used, and are glued to a slot cut into the spars and ribs. Only one trimming tab is necessary; if you want

(Continued on page 34)


SCALE - 3/16 = INCH ℄ NOTED
WING AND STABILIZER ASSEMBLY ℄ DETAILS.
DESIGNED BY P. Klostring
DATE 10-10-40
MODEL WP-6
F
F
1 13/16
3 3/16
4 5/8
7
9 3/8
11 3/4
14 1/16
16 3/16
18 1/4
20 5/16
22 3/8
24 7/16
26 1/2
28 9/16
30 5/8
31 13/16
33 1/16
34 3/4
VERTICAL ℄
1/8 PLANKING
SECT. F-F
SCALE - 3/8" = 1"
1
3/16 O.D. BRASS BUSHING
3/8 x 1/2 BRASS STRIP.
DRILL #36
1/4 O.D. WASHER.
SECTION G-G.
SCALE 3/8" = 1"
12 1/8
11 11/16
13
5 1/8
G
G
1/2
3 7/8
RIB STA. 12 1/8
RIB STA. 11 11/16
RIB STA. 5 1/8. TYPICAL FOR ALL RIBS.
4 1/2° DIHEDRAL
3/32 TIE RODS.
HORIZ. ℄
2-56 BRASS NUT
.125 MUSIC WIRE
1/4 O.D. WASHER
1/4 x 1 3/8 BRASS STRIP
VIEW E.
SCALE 1/2" = 1"
LANDING GEAR CLIP. 1/4 x 1 BRASS STRIP. 3 REQ. DRILL 1/8 1 HOLE IN EACH.
E
TREAD 15 3/4
CUTOUTS OPTIONAL.


ENGINE MOUNT
PINE BLOCK
1/8 BALSA PLANKING
STABILIZER SUPPORT
FRONT CABANE STRUT
REAR CABANE STRUT
STA. 1/2
STA. 4
STA. 8 11/16
STA. 12 11/16
STA. 16 11/16
STA. 19 1/8
STA. 21 7/16
STA. 23 3/4
STA. 26 3/4
STA. 29 3/4
STA. 32 3/4
STA. 36 7/8
RIB 1 5/8
RIB 2 15/16
RIB 4 1/4
RIB 5 1/2
RIB 6 3/4
4-40 BRASS NUT
SHEET BRASS
SECT. B-B
DRILL #36
4-40 X 1 3/8 SCREW
STAB. SUPT.
SOLDER
VIEW A
HALF SIZE
RUDDER POST 1/4 X 1/2
REAR FACE OF PROP.
COWLING IN SECT. COND.
GROUND
THRUST
WING (REF.)
LENGTH OVERALL 44 3/16
BOOSTER PLUGS.
1/16 X 1/8 STRINGERS 24 REQ.
STABILIZER (REF.)
1 DIA. TAIL WHEEL
3/16 SQ. LONGS. 3 REQ.
BATTERIES (REF.)
COIL (REF.)
COWLING BLOCKS
STIFF PAPER FAIRING
STRIP
TYPICAL LAND GEAR SECT.
4 1/2 DIA. WHEEL.
COWLING
SHOWING GRAIN OF BLOCKS.
NOTE: COWLING IS ATTACHED WITH FLUSHHEAD SCREWS ~12 REQ.~
2-56 NUT.
BRASS STRAP SEE DETAIL
2-56 X 7/16 SCREW
SECTION C-C HALF SIZE.
TYPICAL FOR WING & STRUT SOCKETS
DRILL 3/32 2 HOLES
1/8 O.D. BRASS TUBE
DRILL #30
TAP 2-56 X 1/4
3/16 BRASS STRIP
SECTION D-D
SCALE ~ 3/4 = 1 INCH UNLESS NOTED
FUSELAGE & RUDDER ASSEM. & DETAILS
DESIGNED BY Gilbert DATE 10-9-40 MODEL WP-6



Flight of Nakajima 19 bombers on a mission of destruction.

THE GANGSTERS' "BIG GUN"

The plane on the cover

by ROBERT McLARREN

MODEL AIRPLANE NEWS' wartime "shooting script" last month called for a "long shot" of the Japanese Air Force, and in "Air Fighters of the 'Setting' Sun" we gave you a panoramic view of Nippon's air power. This month our script reads: "Pull up to a close shot: Nakajima Bomber," and with the aid of a rubber-tired dolly, a 50-ft. boom and full camera equipment lacking only a sound truck and crew, our director yells "Action!"

It is important to remember that Japanese aircraft are, almost without exception, distinct if not faithful copies of foreign designs. And it is equally important to bear in mind that Japanese government, industry and society are ruled by "families" which are kin not by direct blood ties alone but by generations of mutual ancestry and clan-like loyalty in all of these things. These two factors have moulded Japan's Airforce and its equipment.

Predominant class in Japanese aviation manufacture (among executives) is the Shizoku, membership in which carries a life-time pension and manifold other subsidies and advantages. Kiyoichi and Kimihei, sons of the once powerful army leader, Shimoshizu of the house of Nakajima, took an early interest in things aeronautical and in the Summer of 1914 began construction of a series of gliders. These were later powered by light motorcycle engines and by 1916 the brothers had developed a comparatively successful two place training or light reconnaissance machine in which the government became interested. Orders followed as did more advanced designs until 1926 when the Nakajima Aircraft Works were established at Ohta in Gumma-Ken with an engine manufacturing group formed at Ogikubo near Tokyo. By 1928 the firm had purchased land and developed its own private air field at nearby Ojima. With the aid of comfortable subsidies and government business obtained through clansmen within the Army and Navy, Nakajima became one of the largest aircraft firms in Japan. With the added advantage of an engine manufacturing division, Nakajima became the favorite of the Army and the Navy and the brothers Kiyoichi (President) and Kimihei (Vice-President) became wealthy and honored men with the Shizoku. Through a series of faithfully periodic meetings of the Shizoku, the leading aircraft manufacturing members drew up plans for purchase of foreign engines and airplanes and by 1930 this plan was in full operation.

Throughout the next five years, with limitless finances, the aircraft industry of Japan managed to acquire a license to manufacture the leading aviation products of the world. Aichi built the French Lorraine engine, Kawasaki built German B. M. W. engines, Mitsubishi acquired the rights to Hispano-Suiza (France), Armstrong-Siddeley (England) and Junkers (Germany), Nakajima manufactured Lorraine and Bristol "Jupiter" engines, all of these together with various engine-starters, propellers, radiators, propeller reduction gearing, superchargers, etc. Some indication of the reaches of this power plant purchasing power by the Shizoku is the present possession of manufacturing rights to the Hispano-Suiza 12X and 12Y "moteur-canon," French liquid-cooled engine mounting a shell-firing cannon between the banks of the "Vee," the most powerful French aircraft engine developed up to the Fall of France in 1940.

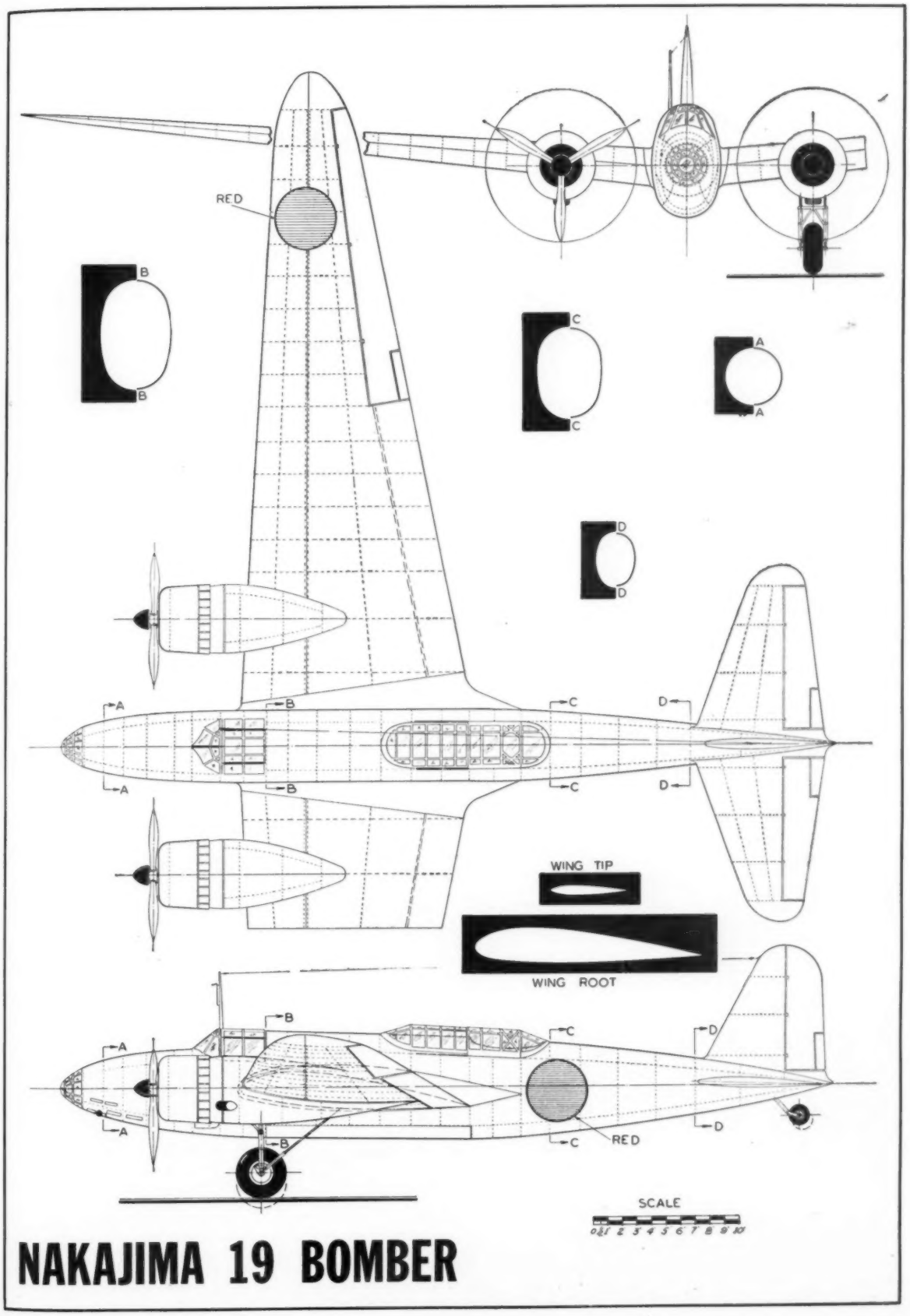
As in engines, so did they invest heavily in airplane manufacturing rights, Kawanishi manufacturing the powerful British Short flyingboats and Rolls-Royce engines, the huge Mitsubishi Combine manufacturing British Blackburn torpedoplanes, Airspeed monoplanes, Junkers bombers and Curtis pursuit planes, Nakajima holding rights to the Fokker and Douglas multi-engine types, Tokyo Gasu Denki building British De Haviland ships, Tokyo Hikoki manufacturing Beechcraft hi-speed biplanes and Tatikawa manufacturing a variety of foreign light training planes too numerous to mention.

Certainly we do not mean this to be a "black list" indicting the American aircraft builders who so willingly and unknowingly gave the Japanese the planes and engines to cut Manila, Luzon and Hong Kong to ribbons. In our diplomatic history with the Japanese Empire she has been second only to Great Britain in good-will, friendship and economic freedom. Since 1853-54, we have had few differences, no major altercations with the Japanese and her trade with us in dollar value has exceeded all other nations in several items, stood high in many others. All of us know that, to every appearance, our friendship still existed as late as that fateful Sunday morning; certainly it was strong in 1938 when our State Department saw fit to permit sale of the giant Douglas DC-4 quadri-motored transport together with all drawings, tools and jigs to the Japanese; this the most powerful airplane of its day!

With acquisition of such property, Japanese aircraft executives traded freely with each other and some new types include predominate features of half-a-dozen outstanding foreign designs. And so it is with the Nakajima Type 19 Bomber, our Plane on the Cover this month.

Following the brilliant success of Glenn

(Continued on page 42)



NAKAJIMA 19 BOMBER

LAKES MAKE GOOD LANDING "FIELDS" *by* GEORGE POMMER, JR.

(Top left) Extra batteries for starting motor (Left) Nose-over landings are cushioned (Right) Every "pilot" is his own mechanic

INSTEAD of being hampered by snow and ice of winter weather, hundreds of model airplane enthusiasts in the Minneapolis area discovered to their delight that the smooth, wide open spaces provided by the frozen lakes served as ideal bases of operation. Even with a fresh breeze prevailing, the gas powered models had ample room to maneuver and drift without approaching shore obstructions, and the thin layer of snow on the ice helped to cushion bad landings. In fact, no field or pasture could ever offer such complete safety. The accompanying photographs were taken while official timing tests were being conducted on Lake Harriet, in this city.

* * *

ACADEMY OF MODEL AERONAUTICS

by ALBERT L. LEWIS

(A Division of the National Aeronautic Association)

Official

Model Airplane News

Angus Heads Contest Board

The appointment of Everett N. Angus of Oaklyn, N. J. as chairman of the A. M. A. Contest Board is announced by National Headquarters. Mr. Angus has served as a member of the Contest Board since its inception and has had wide experience as both meet director and contestant.

Mr. Angus replaces Bruno P. Marchi, chairman and technical director of the Academy, who left last summer to serve in the United States Army. Mr. Marchi was recently transferred to California, and then the state of Washington, and at last account had been ordered to Alaska. If there is any model plane activity in Alaska we can count on the ex-Contest Board chairman to uncover and report it.

To replace Mr. Marchi as a member of the Contest Board from the Fourth District, Russell Nichols of Silver Spring, Md. has been selected. Mr. Nichols is president of the Association of Model Airplane Clubs, the Academy council for the District of Columbia and vicinity; he has had wide experience as a model builder and leader and has demonstrated great capabilities in this field. In addition to his efforts to secure a model airport for the flyers of Washington, he is currently serving on the A.M.A. Education Committee and has done much groundwork in developing interest for aviation education in the public schools. Mr. Nichols has done considerable flying as a light plane pilot and is qualified to view the model competition activity from both the junior and full-scale aviation angles.

Angus Heads S.J.G.M.A.A.

The new Contest Board chairman is senior adviser to the South Jersey Gas Model Airplane Association. This group, under his direction, has sponsored some of the largest regional meets and these competitions have met with wide success by being conducted "of, by, and for the model builder."

That Mr. Angus has specific ideas regarding rules and regulations is demonstrated in an article by him which was run in the previous issue of *Model Aviation*. Chairman Angus is a consulting textile engineer and has specialized in the design and service of custom-built dryers for the textile and lumber industries for a number of years. He is an expert in developing plans, specifications, layouts and surveys for these two industries. His work takes him around the country a great deal, enabling him to meet different model groups, and practically all his long-distance traveling is done by airliner. He flew to Washington three times and to Chicago and Pittsburgh once during the past competition season to sit in on Academy sessions.

Although he is busy like many others these days, Chairman Angus can be counted upon to throw his entire effort into developing better (and perhaps fewer!) rules for the next competition season.

1942 Nominating Committee

The Executive Committee of the Academy has voted upon the 1942 Nominating Committee and announced that it is as follows: For District I, Gunnar Munnick, 101 Alstead Street, Quincy, Mass.; District II, E. N. Angus, 24 Ormond Avenue, Oaklyn, N. J.; District III, Richard Korda, 3223 E. 116th St., Cleveland, Ohio; District IV, Gordon Light, 1213 Belvedere, Baltimore, Md.; District V, W. T. Thomas, 105 N. Halifax, Daytona Beach, Fla.; District VI, R. H. Sommers, Stix, Baer & Fuller, St. Louis, Mo.; District VII, H. F. Auler, 1743-45 Fond du Lac Ave., Milwaukee, Wisc.; District VIII, John E. Clemens, 2112 Greenville Ave., Dallas, Texas; District IX, Jack Moralez, 1118 O Street, Lincoln, Nebr.; District X, Barney Snyder, 7306 S. Vermont, Los Angeles, Calif.; District XI, Nevilles (Jim) Walker, 4404 N.E. 39th Ave., Portland, Ore.

Under "Article VIII—Nomination and Election of Officers," the following sections apply:

Section 1. National officers shall be nominated by a nominating committee, composed of eleven leader members, one from each of the A.M.A. districts in the United States. These eleven leader members shall be appointed by the A.M.A.

(Continued on page 30)

TRAIN BY FLYING THE FLEET TRAINER

Flight and appearance rivals its full scale prototype

A stable easily constructed scale biplane that flies consistently

by **SYDNEY STRUHL**

WITH Britain rapidly gaining air supremacy over Hitler's Luftwaffe there is an ever increasing demand for British young men to pilot the famed Spitfires and other deadly English designs. But before any man can fight for democracy in a fast pursuit ship he must be moulded into fine pilot material by an intensive training program.

Perhaps some of you have been wondering just what the British are using for this primary flight training.

Well, the most popular of all British primary trainers in England and Canada is the new redesigned Fleet Trainer, our flying scale feature this month.

The fondness shown by pilots for the Fleet Primary Trainer is well deserved, for this ship is a "Dodo's" dream. It has built-in stability; whenever the Dodo gets into trouble "up there" all he has to do is let the the controls free and the ship rights itself in short order.

The Fleet Trainer is ideally suited for mass production, being reasonable in price. Construction is welded steel tubing, fabric covered, with wings of laminated spruce spars and aluminum alloy ribs. Power is supplied from a 160 hp. Kinner engine; maximum speed 160 m.p.h.—cruising speed 110 m.p.h.—service ceiling 16,500 feet—cruising range 320 miles. Landing speed is only 45 m.p.h.

The Fleet Trainer as a flying scale model is the answer to a model builder's dream. Many modelers are looking for a biplane to build because there is something about a biplane that provokes dreams of flying your own ship with your head in the slip-stream, zooming for the clouds, and—oh, well. This little biplane makes a dandy flier and its stability will amaze you. Climb is steady and long; flights of over a minute, common.

Construction is as simple as can be found in any flying scale model and, although it is very strong the original model weighed only 1-1/4 oz.! Here's the proof!

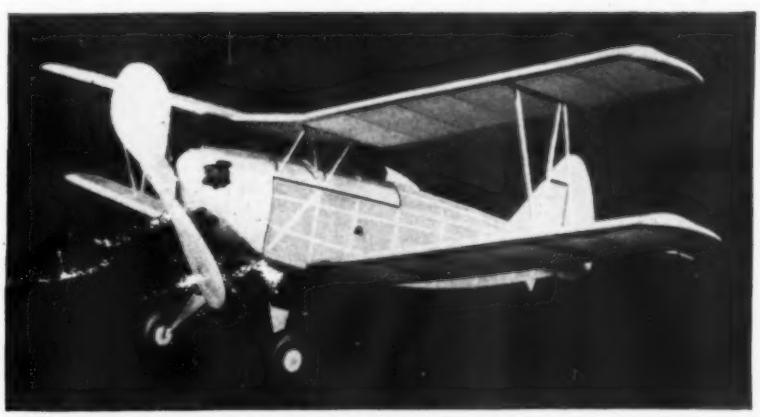
FUSELAGE. It will be necessary before starting construction to line up the magazine pages so you have a complete drawing of each member to be constructed. The fuselage is built as usual by building two sides and then connecting them with cross members.

Make the two sides at one time, building one directly on top of the other. All stock used is 1/8" square balsa strips. After the cement has set remove the two sides from the drawing and connect with cross pieces as shown in the top view of the fuselage plans. Now cut all fuselage bulkheads from 1/16" sheet and cement them in place. Add stringers of 1/16" square balsa as shown in the plans. Note that there are two stringers on each side of the fuselage, these are cemented directly on the uprights. Fill in the rear hook station with 1/8" sheet to act as a base from the rear hook. Bend the rear hook and extend a piece of the wire below the fuselage and form the tail skid.

Carve the nose block from very soft balsa and hollow it to thickness shown by the broken lines in the drawing. Make the nose plug as shown and add a square to the back so it will fit into the nose block.

Five cylinders are required. The author cut his cylinders from a celluloid motor purchased from a local supply house. If these celluloid cylinders are not obtainable

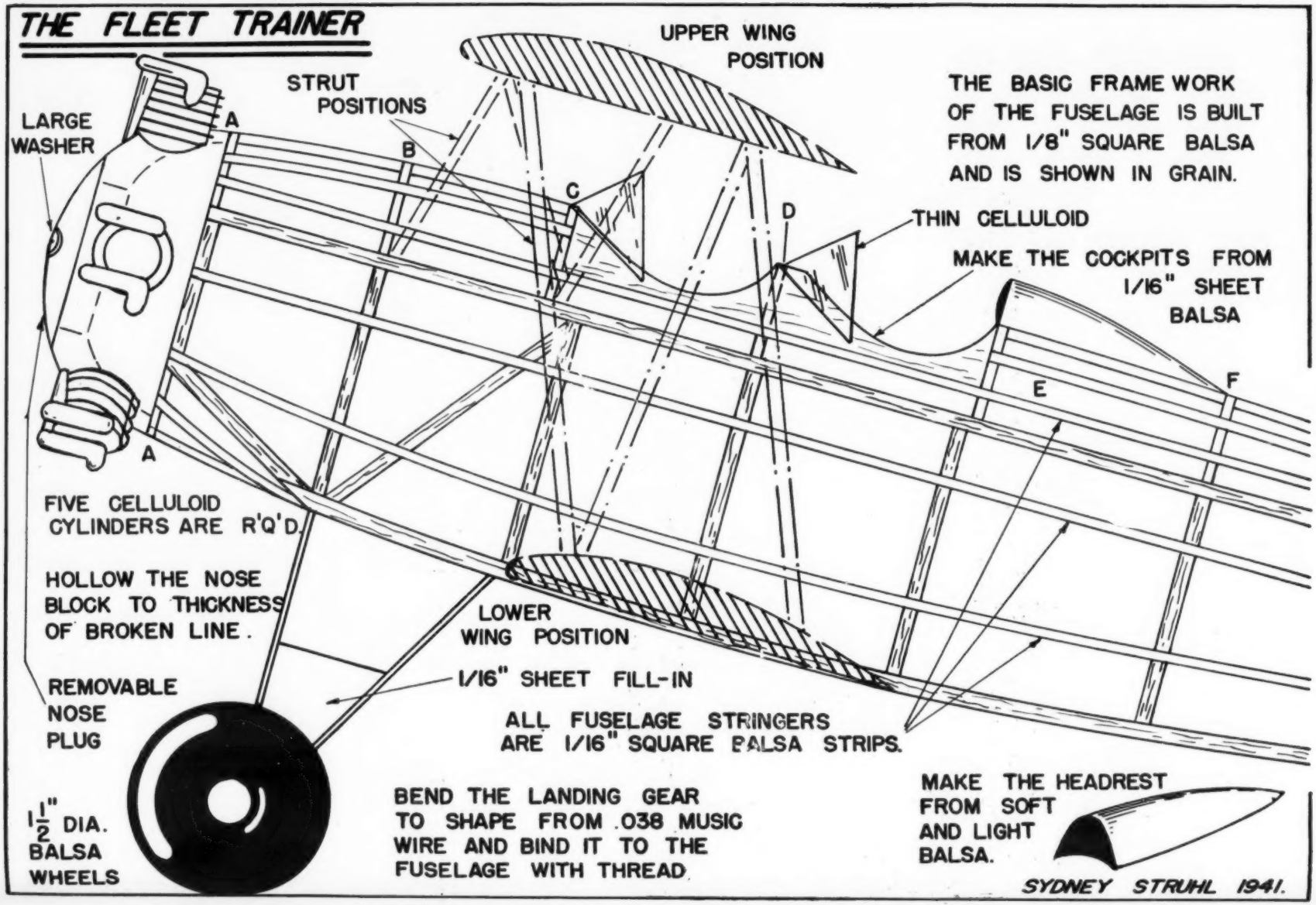
(Continued on page 40)



A large propeller flies this biplane like a monoplane

Few but bulky parts make assembly easy

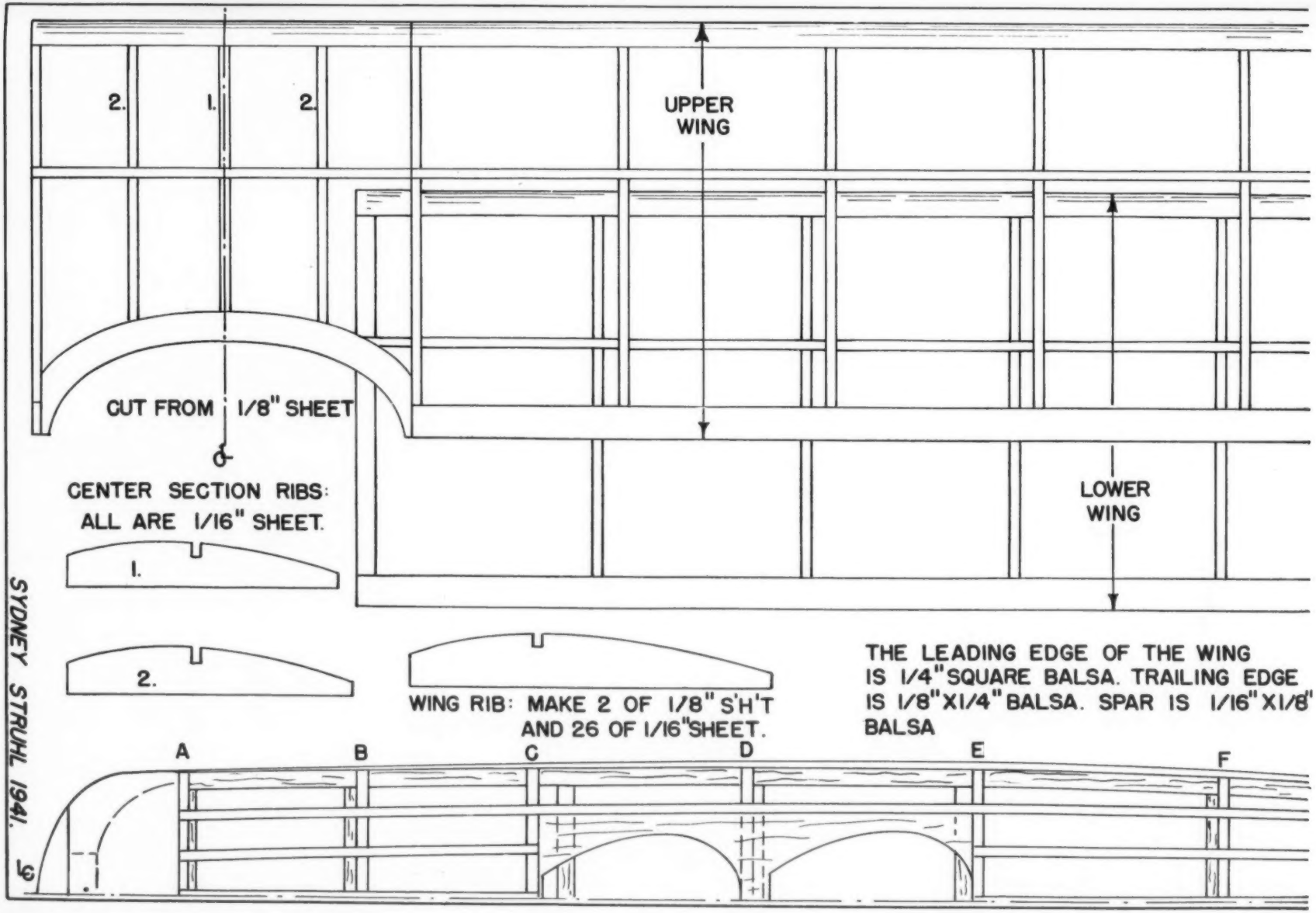
THE FLEET TRAINER


UPPER WING POSITION
STRUT POSITIONS
LARGE WASHER
A
B
C
D
E
F
THE BASIC FRAME WORK OF THE FUSELAGE IS BUILT FROM 1/8" SQUARE BALSA AND IS SHOWN IN GRAIN.
THIN CELLULOID
MAKE THE COCKPITS FROM 1/16" SHEET BALSA
FIVE CELLULOID CYLINDERS ARE R'Q'D.
HOLLOW THE NOSE BLOCK TO THICKNESS OF BROKEN LINE.
LOWER WING POSITION
1/16" SHEET FILL-IN
REMOVABLE NOSE PLUG
ALL FUSELAGE STRINGERS ARE 1/16" SQUARE BALSA STRIPS.
1 1/2" DIA. BALSA WHEELS
BEND THE LANDING GEAR TO SHAPE FROM .038 MUSIC WIRE AND BIND IT TO THE FUSELAGE WITH THREAD
MAKE THE HEADREST FROM SOFT AND LIGHT BALSA.

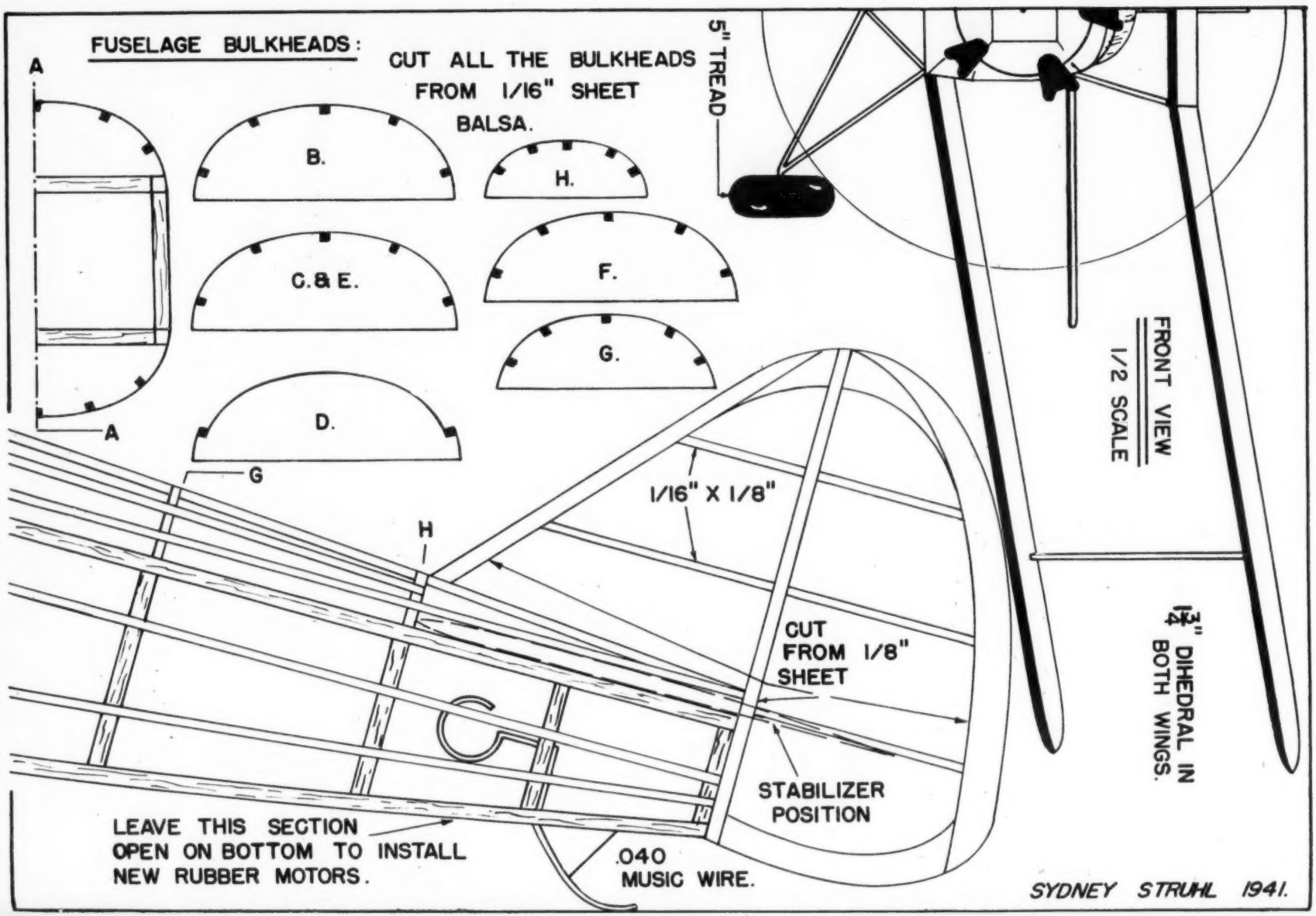
SYDNEY STRUHL 1941.

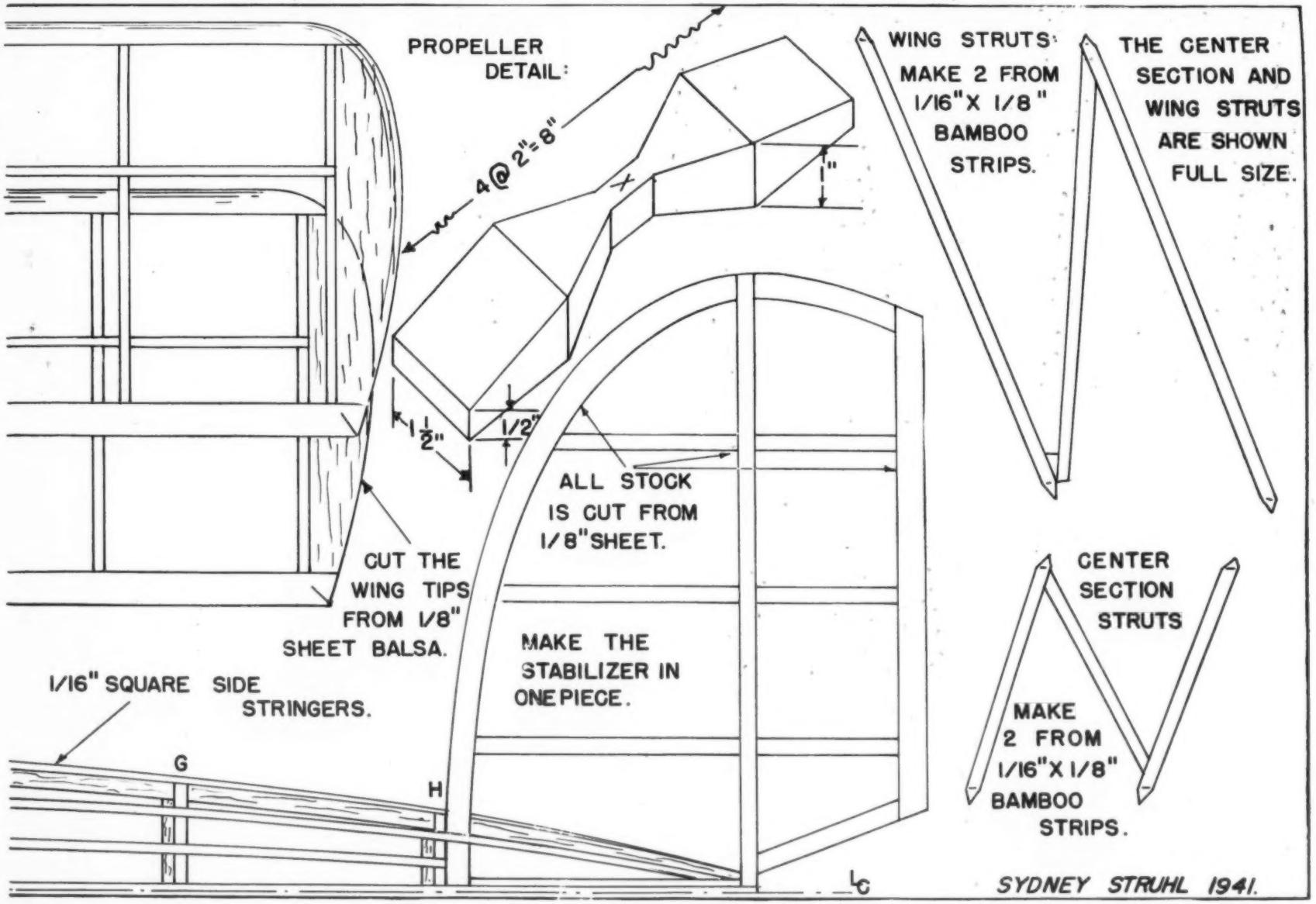
WHEELS

SYDNEY STRUHL 1941.



SYDNEY STRUHL 1941.


FUSELAGE BULKHEADS:
CUT ALL THE BULKHEADS FROM 1/16" SHEET BALSA.
A
B.
H.
C.& E.
F.
G.
D.
A
G
H
5" TREAD
FRONT VIEW
1/2 SCALE
1/16" X 1/8"
CUT FROM 1/8" SHEET
STABILIZER POSITION
LEAVE THIS SECTION OPEN ON BOTTOM TO INSTALL NEW RUBBER MOTORS.
.040 MUSIC WIRE.
3/4" DIHEDRAL IN BOTH WINGS.
SYDNEY STRUHL 1941.


PROPELLER DETAIL:
4@ 2"=8"
X
1"
1 1/2"
1/2"
WING STRUTS: MAKE 2 FROM 1/16" X 1/8" BAMBOO STRIPS.
THE CENTER SECTION AND WING STRUTS ARE SHOWN FULL SIZE.
ALL STOCK IS CUT FROM 1/8" SHEET.
CUT THE WING TIPS FROM 1/8" SHEET BALSA.
MAKE THE STABILIZER IN ONE PIECE.
1/16" SQUARE SIDE STRINGERS.
G
H
CENTER SECTION STRUTS
MAKE 2 FROM 1/16" X 1/8" BAMBOO STRIPS.
SYDNEY STRUHL 1941.

Academy of Model Aeronautics

(Continued from page 24)

Executive Council sixty days prior to the date of the Annual Meeting.

Section 2. The nominating committee shall meet during the Annual National Model Airplane Contest to make nominations for national officers. In the eventuality that one or more A.M.A. districts are not represented at the scheduled meeting of the nominating committee, the president shall be authorized to fill such vacancies from A.M.A. leader members present who may reside in districts not represented.

Section 3. Nominations may be submitted in writing to the members of the nominating committee by any A. M. A. leader member in good standing prior to the meeting of the committee. Committee members who, for some reason, find it impossible to attend the meeting of the nominations committee, are authorized to transmit the nominations which they have received to the place where the meeting is to be held and such nominations shall receive full consideration of the nominating committee.

Section 4. All national officers shall be elected by mail vote, ballots for which shall be forwarded to all leader members of the A.M.A. in good standing not later than 15 days following the meeting of the nominations committee. The mail vote shall be handled by the A.M.A. Headquarters Director, but the counting of the ballots shall be under the direct supervision of the General Manager of the National Aeronautic Association.

All members of the Academy, both leader and associate, are privileged to express their thoughts concerning the eligible candidates to their district representative of the Nominating Committee. It has been agreed that the Executive Committee inform this Nominating Committee that it should not hesitate to make nominations from among its own membership.

This publication, insofar as possible, will carry communications regarding various candidates endorsed, providing such communications are brief and to the point. Now is the time to start thinking about Academy officers for the 1942-43 season.

National Rules

The A.M.A. Contest Board, under the able leadership of E. N. Angus, is literally working night and day to evolve sensible regulations which will develop our important hobby-sport to an even greater degree than in the past.

Never before have so many good suggestions been advanced for next year's rules. It is taking time to sift all these suggestions and determine their worth. It may be a few days or a few weeks before the final regulations are ready. As soon as they are decided upon they will be issued in printed form by National Headquarters.

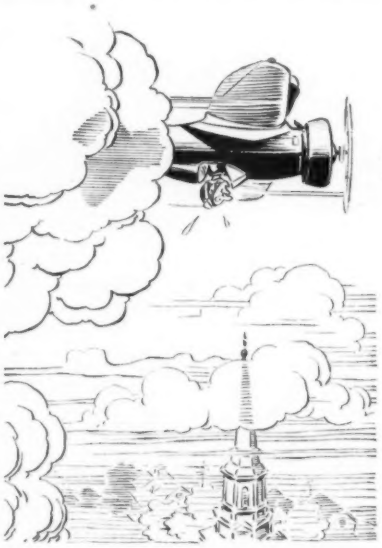
Activity Bulletin Distributed

The National Aeronautic Association sent recently to the representatives of all active Academy chapters a copy of the *N.A.A. Activity Bulletin No. 1.* The bulletin contains a list of films and speakers for local meetings available from the aviation industry and from public agencies in the aviation field.

C. S. Logsdon, of N.A.A.'s Chapter Division, completed this survey listing dozens of sources from which cooperation is to be had for the asking.

Numerous movie films, some silent and some in color and sound, are available without charge. Among them are Bell Aircraft's picture of the Airacobra in action; pictures of the Messerschmitt 110, from Vultee; fabrication of planes at the Lockheed plant; and other subjects of absorbing interest to any audience. Of particular interest to model groups are the films available from the National Advisory Committee for Aeronautics and the listing of aviation publications obtainable from the Government Printing Office.

The first Activity Bulletin is available without charge to new Academy chapters; leaders and others who can put the material to good use may secure a copy for the nominal fee of 15c from A.M.A. Headquarters, Willard Hotel, Washington, D. C.



—and I promised her I would never stunt.

Roll Call

The Academy's National Defense Roll Call of active model airplane clubs in the United States has met with considerable initial success. A number of registrations have been filed with Washington Headquarters and the recent issues of the model airplane magazines carry the Roll Call form. It is to be expected that additional registrations will flow in from this source.

Manufacturers have evidenced a desire to aid the A.M.A. in compiling this very essential listing of all model aero clubs. Comet Model Airplane and Supply Co. has distributed several thousand copies of the Roll Call form throughout the country and a supply of these forms is available from the Washington office should any other concerns wish to aid in the survey.

If your club has not yet registered, you should take it upon yourself to make sure a form is filled out immediately and sent to Washington.

Fifteenth National Meet Awarded to Chicago

The 15th National Model Airplane Championships are scheduled to be held in the city of Chicago some time in August, 1942, it was announced by N.A.A. and A.M.A. Headquarters. Sponsorship is expected to be by the Chicago Park District and the *Chicago Times*, as in the previous two years. Meet management personnel will be pretty much as it was last year, and it is expected that Steve Meuris will serve as Meet Manager and John Rappold as Contest Director. F. E. Kardes, Supervisor of Crafts, Chicago Park District, will have an important part in arrangements for this annual official competition.

August was decided upon as the best month after many communications had been received from aeromodelers throughout the country asking that a later date be selected than in previous years. Full cooperation of the National Exchange Club has been pledged and it is significant to note that Maurice Roddy, Aviation Editor of the *Chicago Times*, is also the chairman of the Exchange's Aviation Committee.

Headquarters for the contest in all probability will be the Hotel Sherman, as in the past, inasmuch as models of craft now being used in the European and Pacific war will be utilized by Air spotter groups and home defense groups throughout the nation.

More information on the 1942 National Meet will be presented as it is made available and at the moment individuals and clubs are requested not to write National Headquarters for detailed rules or a schedule of events.

Zaic Considers Army Modelers

Among those who have been considering ways and means of keeping model builders who have entered the nation's armed forces acquainted with the changing model picture is Frank Zaic, of New York City, proprietor of the famous Model Aeronautics Yearbooks and a member of the A.M.A. Technical Committee.

The following is Frank's suggestion for a new model aeronaut's unit. Your comments and suggestions will be appreciated by both Mr. Zaic and Academy Headquarters.

MODEL AERONAUTICS IN THE U. S. ARMY

A Proposal by Frank Zaic

Purpose: To help model builders now in service to continue their favorite hobby and also help them meet their fellow model builders through publication of lists.

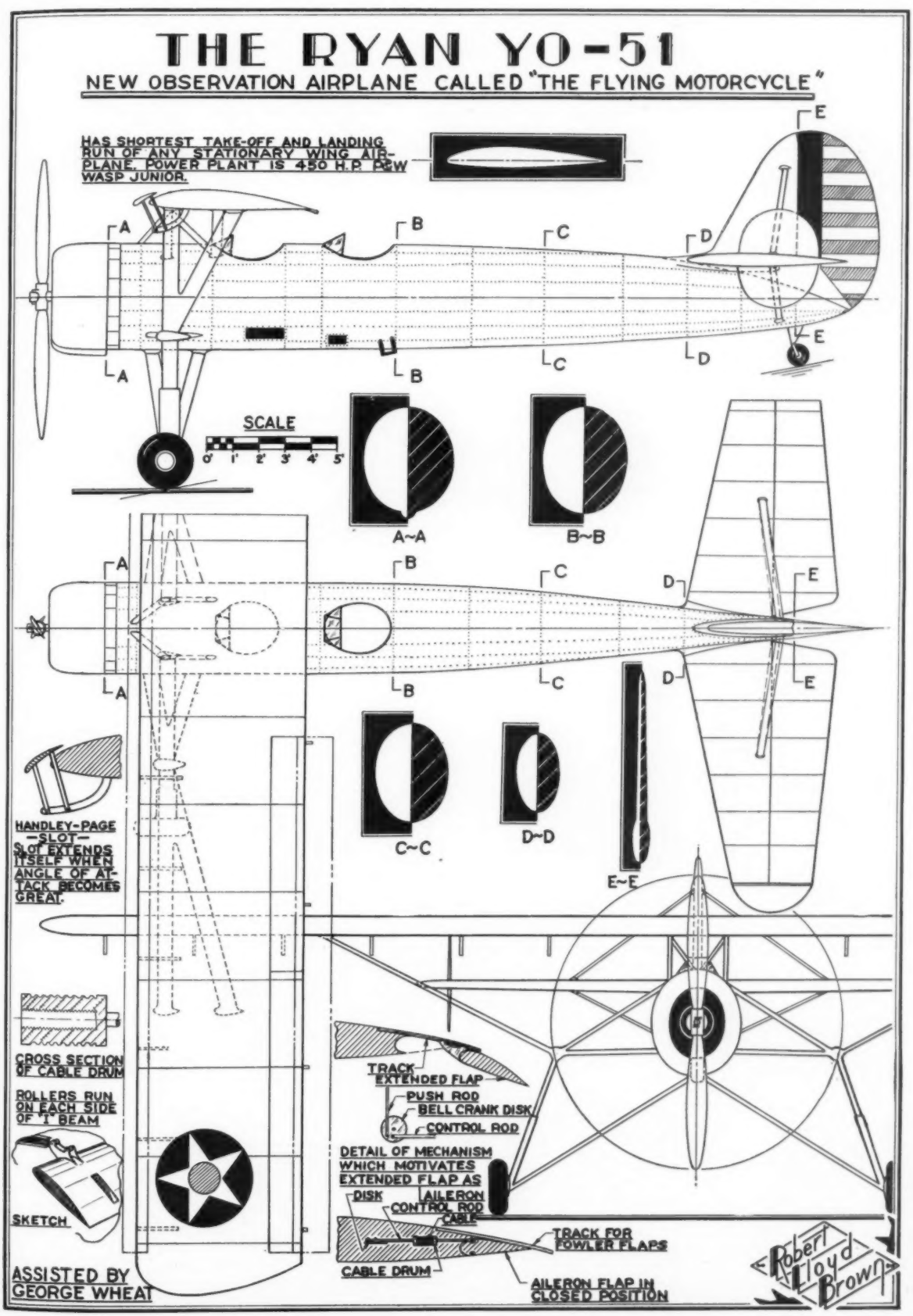
Service: It is proposed that the Academy of Model Aeronautics act as a clearing house for the members. Prospective member would send his name to the headquarters. A list containing members from his particular district would be sent to him in return. After a certain period the list would be revised and his name included.

It would be up to every camp to organize its own group. Academy Headquarters would assist as much as possible by furnishing information on club organization.

(Continued on page 58)

THE RYAN YO-51

NEW OBSERVATION AIRPLANE CALLED "THE FLYING MOTORCYCLE"



★ ★ ★ SCI

NEW DEFENS

FLYING SCALE MODELS OF AME

BIG 3

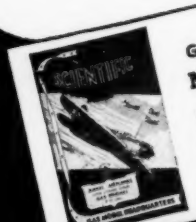
COMPLETE KIT

5

CURTISS HAWK P-42
U. S. Army Pursuit Plane

CURTISS SB2C-1
U. S. Navy Dive Bomber

If you're looking "in
here they are— sc
of the pursuits an bers
performing so w Unc
World War 2. I ex
building and pla behi
curate detail, th ility
light but sturdy a of
models—and ea y or
rate to the last d eal
kits are comple ude:
cut propeller; na ishe
silkspan (in 2 s loid
dows; cement; pa 2 co
taining pilot, sta il st
words U. S. AR A. NA
size plan conta ers,
exhaust, motor d shbo
easy-to-understa ons,
All have a BIG 3 Co
completeness of t , tha
unequalled by a th
today—then yo ize
amazing value th ly .



Get your copy of Scientific's
NEW 1942 CATALOG
44 Pages—chock full of NEW big bargains in Model Airplanes, Model Airplane Supplies, Gas Engines, Race Cars, Speed Boats, etc. Send . . . .
5¢

SCIENTIFIC MODEL

"GAS MODEL HEADQUARTERS" 8-2

TIFIC'S ★ ★ ★

NE SERIES

AME'S LATEST PURSUITS AND BOMBERS

3" WING-SPREAD

A GUARANTEED SCIENTIFIC PRODUCT

TE 5¢ POSTPAID or at your dealer

e looking "in the news", ey are— scale models ursuits an ers which are ning so w Uncle Sam in War 2. experimental g and pla ehind the ac- detail, th ility, and the t sturdy of these new —and ea y one is accu- the last d eal plane! All e comple ude: machine peller; no ished wheels; n (in 2 c loid for win- ement: pa 2 colors) con- pilot, sta il stripes and U. S. AR NAVY); full an contin ers, patterns, , motor s shboard, and -understa ons, etc., etc. e a BIG 3 Consider the teness of , that they are lled by the market -then yo ize what an g value t ly... 95c

REPUBLIC P-47
U. S. Army "Thunderbolt" Pursuit

BREWSTER 340
U. S. Navy Dive Bomber

See our complete line of new 1942 models at your dealer . . . rubber-powered, gas-powered, Gliders, War Planes, etc. The new Scientific line for 1942 is the greatest line we've ever offered to model builders.

DEL AIRPLANE COMPANY

RS" 8-220 MA-3 MARKET ST., NEWARK, N. J.

Climbs 1000 Feet Per Minute

A Spectacular Flier! Simple to Construct!

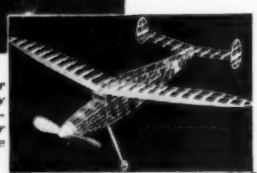
Fellows! The "Para-Trooper" is the big model for 1942. And Boy! How she can fly! Just wind her up fully—adjust parachute release—set her on the ground and watch her race along for 3-4-5 feet, her tail lifts, and the wheels leave the ground. The model noses up steeply and climbs at the amazing rate of 1,000 feet per minute. At the peak of its climb the "Para-Trooper" levels out and begins to release its parachutes, one by one. You will agree that this is the most spectacular sight you have ever witnessed. And YOU can easily build the "Para-Trooper" yourself in only one evening.

BIGGEST KIT VALUE TODAY! 50" "PARA-TROOPER"

$1.50 Postpaid Complete

The "Para-Trooper" conforms to all N.A.A. requirements and is a real contest performer.

Kit has many finished parts including a large Tru-Pitch propeller, cowling, balsa wheels, wire parts, hardware and all materials for building 4 parachutes and automatic release. All ribs, bulkheads, etc., clearly printed on sheet balsa. All strip balsa accurately cut to size, bottle cement, fine colored tissue and insignia, celluloid, etc., etc. Complete set of full size plans and detailed instructions with photographs.



U.S. Coil With High Tension Lead

Lightning-fast start. Low drain. Heavy duty 1⅞ oz. ignition coil. For A, B or C plane, boat or car engine.

$1.00 Postpaid

DEALERS JOBBERS Rush your orders today (regular discounts) for immediate shipment, or write for full particulars.

UNITED STATES MODEL AIRPLANE CO.
44 OAKLAND TERRACE, NEWARK, N. J.

Gas Up This Navy Bomber

(Continued from page 19)

to, you may use one also on the right wing panel.

The leading edge is 1/2" wide and is made in four sections as shown. A piece of balsa 1/16" flat is glued between the spars at the wing tips, cut out for lightness. This serves as a base or something to hang the wing tip outlines on. They are 1/2" wide, and vary in cross section where they join the leading edge to the trailing edge. The false ribs are entirely optional, and serve no purpose but to make a better contour for the wing nose section. They can be plotted on a graph quite easily because lengths and heights are given on the plans. The curve will be very similar to the adjacent ribs. The center section of the wing between Ribs right and left No. 3 3/16 are covered with 1/8" medium balsa planks approximately 3/8" wide. Although there is a cut-out in the center section bottom to admit the cabane unit, the entire bottom may be covered and cut out later on assembly. Finish the wing by sanding all rough spots and give the center section two or three coats of dope to serve as a primer.

THE STABILIZER: The stabilizer is quite simple in construction. Three ribs are shown, and Rib 5 1/8 is typical of all in height and contour, but not length, except the two tip ribs. Cut out all the ribs and assemble them on the spar, which is a birch dowel 1/4" round. The stabilizer outlines are all 1/2" wide, and vary from 3/8" at the leading edge to about 1/8" at the trailing edge. Use medium balsa for all the curved portions, let the grain run lengthwise. Trim these down, and glue in a white pine block as indicated 3/8" square and having one corner shaped to fit against the spar. The braces are 1/8" square hard balsa. The stabilizer center section is a block of white pine having the same contour as the ribs. A brass brushing is glued into a hole drilled as shown. Countersink both sides to give the glue a better grip. This is part of the adjustable stabilizer unit. The brass strip which forms another part is bent as shown. It is drilled 3/32" for a 3/8" brass roundhead screw. On assembly, a brass washer is used as a spacer. Clean up the stabilizer as you did the wing, and set it aside.

THE FUSELAGE: The fuselage is the most complicated single unit of the entire model, and will require a good deal of work. We can begin construction by laying out the two top longerons on a board. This fuselage has but three longerons, and thereby, construction is simplified. There are crosspieces only at 28 3/4 to 32 3/4. There are three main bulkheads at Stations 8 11/16, 12 11/16, and 16 11/16. The firewall is 1/4" thick white pine, while the other two bulkheads are 3/16" thick hard balsa. After cutting them out and drilling all the holes for wires, bolts, engine mounts, and such, slip them on the longerons and glue firmly. When dry, slip the lower longerons into the proper holes, allowing to dry before installing the uprights. All crosspieces, uprights, diagonals and longerons are 3/16" square hard balsa. There is a half-bulkhead at Station 32 3/4 or 1/8" hard balsa. The stabilizer support consists of a piece of 1/8" hard balsa cut out as shown, and a white pine block running between Stations 32 3/4 and the rudder post.

Now is a good time to build the fin. It is made in the same manner as the stabilizer. When the support and fin are securely on, try the stabilizer for fit, and cut whatever is necessary from the support to allow for some variation of the angle of incidence. As noted, a brass screw is used to attach the spar clip. Mark the point where the stabilizer center bushing falls, and drill a hole. The nut portion of the adjustable stabilizer unit is made from a nut soldered to a brass strip as indicated in View A and Section B-B. Bind it to the support with some strong thread, and glue it thoroughly. We can put on the streamline for the tail wheel now. It is carved and hollowed out from medium balsa. Note in Section D-D that a brass strip runs through this fairing. The ends are bent up as a tab and two pieces of brass tube, drilled and tapped as shown, are soldered to it. Solder these only temporarily. For the tie rods, use 3/32" round hard aluminum wire; failing that brass or welding rod will do, although they add quite a bit of weight. The upper ends of these are flattened and drilled 3/32" to take a 3/8" brass roundhead screw, which screws into the white pine blocks in the stabilizer. The lengths must be gotten from an actual fit. The lower ends are threaded 2-56 with a die and screw into the brass tubing; use a locknut to prevent loosening. To line up the tubing, screw the rods in and heat the solder to the melting point. Line up the rods without screwing them to the blocks and solder the joint permanently. Remove the rods, use plastic wood around the brass tubes to make a neat fillet. The wheel axle is simply a heavy piece of wire pushed through the fairing. Glue two small paper discs over the ends to prevent it from sliding or working out. Coat this fairing rather heavily with dope, sand it smooth.

Let us get back to the fuselage forward part which has been so sadly neglected. There are four cabane struts of white pine. They are 1/4" x 1/2" x 6" long for the front ones, and 5 3/4" long for the rear ones. They form front and rear V's, and are glued thoroughly to the bulkheads. Two braces of white pine 1/8" x 1/2" run between them, and the whole is again glued thoroughly. A strong joint is needed here, so do not be sparing of the cement. The two aluminum tubing sockets are soldered to the straps, as was done to the center ribs of the wing, and are bolted on. Trim the tops of the rear struts down if necessary to obtain 2 degrees of incidence. This is measured from the longeron line by a cardboard template.

The engine mounts may be installed at this point. They are 1/2" x 7/16" x 12 1/4" long, made of hickory. Hickory will split before breaking off, which is what is needed here. Cement these mounts in securely because engine vibration is concentrated at these points and a weak joint may mean disaster.

Before we go any farther, let us put in the landing gear. It is quite simple, and made primarily from 1/8 O.D. music wire. The true bend of it is shown in the front view. To install make three brass clips as shown. These clips fit around the landing

PLANE TALK

SKYWAY

UTILITY KNIFE

(the answer to a modeler's prayer)

ALMOST 6" tip to tip

A THIN DIME NEVER BOUGHT THIS VALUE BEFORE

Razor Sharp—Double Edge Blade! Can't Slip—Refills in a Jiffy.

Dealers, Your Jobber stocks UTILITY KNIFE for immediate delivery.

10¢ Comp. with Blade

Ex. Blades, 2 for 10c. By mail: Add 5c postage.

18" BALSA STRIPS
Select, Hard Stock

1/16 sq.	60 for 5c
1/16x1/8	30 for 5c
1/16x3/16	18 for 5c
1/16x1/4	15 for 5c
3/32 sq.	25 for 5c
1/8 sq.	20 for 5c
1/8x3/16	12 for 5c
1/8x1/4	10 for 5c
3/16 sq.	8 for 5c
1/4 sq.	6 for 5c
1/4x1/2	3 for 5c

18" Balsa Sheets

1/64x2	5 for 10c
1/32x2	8 for 10c
1/16x2	7 for 10c
3/32x2	6 for 10c
1/8x2	5 for 10c
3/16x2	3 for 9c
1/4x2	3 for 11c
1/2x2	2 for 13c

3" & 36" cost twice
18"; 3x36, 4 times

NOSE BLOCKS

1x2x1	1c
2x2x1	2c
2x2½x1	3c
3x3x1	4c
3x3x2	7c
3x3x3	9c
5x5x2	17c

5 FOOT BALSA
Minimum 50c

1/8x1/8	10 25c
1/8x3/16	9 25c
1/8x1/4	8 25c
3/16 sq.	7 25c
1/4 sq.	6 25c
1/4x1/2	3 25c
3/8 sq.	3 25c
1/2 sq.	2 25c

Sheets, 4 times 18".
Double the above price for genuine aircraft SPRUCE

18" Balsa Planks

1/2x1/2	2 for 5c
1x1	6c ea.
1x2	12c ea.
2x2	23c ea.
2x3	35c ea.
2x6	69c ea.
3x6	98c ea.

Plastic Balsa
4 oz. 23c, 1 oz. 10c

PROP. BLOCKS

1/2 x 3/4 x 5	7—5c
1/4 x 3/4 x 6	6—5c
3/4x 1x 8	3—5c
3/4x1 1/4x10	2—5c
3/4x1 1/4x12	3c ea.
1x1 1/2x12	5c ea.
1x1 1/2x15	6c ea.

Plywood—1/16
1/8, 3/16, 1/4 40c ft.

SKYWAY GAS MOTORS
No Premiums or Packing
Charges on Motors—P.P. 15c

Ohlsson "19"	$16.00
Ohlsson "23"	18.00
New Ohlsson "60 Special"	20.00
Forster "99" Ball bearing	22.50
New Forster "29", Class B	18.75
"O.K." Special or "49"	15.50
"O.K." Twin, for radio con.	40.00
Elf "A" 16.50—"Twin"	35.00
New Elf "4"	49.50
Brown D $12.50. New "B"	16.50
New Super Atam	15.50
Rogers "KD 29" Kit	4.95
Rogers "29" $12.00—"35"	12.95
Mighty Midget	12.50
Gwin Aero 15.00, Tiger Aero	18.50
Sky Chief	7.95

Big Allowance for Old Motors!

CEMENT
CLEAR DOPE
Banana Oil
1 oz. 6c, 1/2 pt. 35c
2 oz. 11c, pint 60c

Colored Dope
1 oz. 8c, 2 oz. 11c
1/2 pt. 40c, pt. 65c

MICROFILM RUBBER LUBE
WOOD FILLER LIQUID CELLULOID
1 oz. 9c 2 oz. 15c

G. M. SILKSPAN
White, Red, Yellow, Orange, Blue
3 for 25c.—"OO" —5c per sheet.

Gas Model Silk
H'vy qual. 60c yd.

AA TISSUE
All col., doz. .25c
Silver, ea. 5c
Superalik, wh. 5c

Bamboo Paper
White 5c, 6 for 25c
Colors, 2 for 15c

Trexler Wheels

1¾	1½—50c
1¾	2—60c
2¼	2¾—70c

Gas Mod. 2¾-1.10
3-1.35—3½-1.60
4½-1.85

M&M WHEELS

1¼	1½, 1⅝ 60c
1¾	2 2⅜ 70c

Gas Mod. 2⅜ $1
Flyweight " 85c
NEW 3" $1.10
3¼ 1.60, 3½ 3.00
4½ 3.00, 6" 4.75

PROPELLERS

Balsa	Paulo	Ritz Wins	Gas
5"	4c- 7c	Mod.	
6"	5c- 9c	8"35c	
7"	6c-12c	9"35c	
8"	7c-13c	10"35c	
9"	8c-19c	11"35c	
10"	9c-22c	12"35c	
12"	10c-28c	13"35c	
14"	12c-40c	14"35c	
15"	15c-50c	15"35c	
16"	16c-X	16"35c	
18"	25c-95c	18"50c	

RITZ Gunwood
8"-9"-10"-11" 15g
12"-13"-14" .15g
15"-16" 25c

Champion Spark Plugs 3/8 or 1/2 50c

GAS MODEL ACCESSORIES

Condensers—Metal, 20c Smith....25c
Plugs & Jacks, Set of 2-35c val. 25c
Midget Tip Jacks 25c val. 2—15c
Terminal Clips 5/8" 10c val. 4— 5c
Gas Funnel, Alum. strainer.....25c
Spaghetti Tubing 1/16" 3 ft.—10c
Toggle Switch 50c val.....25c
"3 to 1" SAE 70 oil—1/2 pt.....25c
12" High Tension Leads—Best....15c
Booster Leads—50c Val. 35c
Masking tape—1/4x36-Instruc. card 5c
Alligator Clips—5c Solderless....10c
Kn'ft Manifold—Keep Ship Clean
Nickel plated 50c. Streamlined $1.00
Spark Plug Wrenches—any size 25c
Neoprene tubing 20c

VOIT WHEELS

3½	1.60, 4½ 1.85
Race Car Set	6.00
Ball Bearing	8.00

COILS

Smith 3 V...$2.75
Competitor ..$1.95
Superlite $1.75
Powerhouse $1.50
Aero-Coil $2.25
Brown Blue..$1.00
U.S. Coil....$1.00

Wing & Tail Lts. (3 in a set)
5/16, 8c 9/16 10c
11/16 12c per set

TIMERS

Austin $1.50
Dural 1.95
Time-Aire .. 1.00

DURAL ANGLE

1/2x1/2 .....20c ft.
3/4x3/4 .....30c ft.

Bona Fide Dealers Write for WHOLESALE PRICE LIST

RUBBER-POWERED ACCESSORIES

Model Pins 1/2 or 1" 100 for..... 5c
Sheet Celluloid 5x7 3c, 14x17....15c
Ball Bearing Washer 10c value.... 5c
Sandpaper, 12 sheets 5x5.....5c
Lilliput Lights—for display model, 3 lamps, wired, instruction sheet. Per set.....60c
Insignia 36—American, French, English, German, Squadron, in colors, gummed, per sheet.... 5c
Washers, pinhole, 1/8, 1/4, 2 doz. 3c
Prop Shafts, doz sm. 6c, large....10c
Nose Plugs for 5c, 1/2"—8, 3/4"—6, 1"—4.

ALUM. TUB'G per ft.

1/16	8c...10c
3/32, 1/8	...10c...15c
3/16, 1/4	15c...18c

Sheet Alum.—ft.
.003 25c .010 35c

BRASS TUB'G per ft.

1/16	8c...10c
3/32, 1/8	...10c...15c
3/16, 1/4	15c...18c

MUSIC WIRE

.014	.....6 ft. 2c
.020	.028 6 ft. 3c
.034	.040 6 ft. 6c
.049	.....6 ft. 8c
1/16"	.....3 ft. 5c
3/32"	...5 ft. 20c
1/8"	.....5 ft. 25c

BROWN RUB'R

1/16 sq. 8 ft. 5c
1/8 flat 8 ft. 5c
3/16 flat 6 ft. 5c
Skein 225 ft.
1/16, 1/8—$1.25
3/16 $1.75,
1/4—$2.50.

Camel H'r Brush
Med. 5c, Lge. 8c
Small 3c, Gas Mod. 15c

Thrust Bearings
1/8 doz. Sm. 8c
1/8 doz. Lge. 12c

Celluloid Radial ENGINES

1 1/4" 8c, 2" 12c
2 1/2" 14c, 3" 17c
4" 58c, 4 1/2" 65c

MACHINE GUNS

3/4" 2c, 1 1/4" 4c
1 3/4" Lewis.... 5c
1 3/4" Lewis.... 6c
1 1/4" Ring Mt. 10c
1 3/4" Ring Mt. 15c

ANNOUNCING!

The NEW **Rogers**

Block tested "RMC2" **$7.95**

B-Class Motor

COMPLETE, READY TO RUN *and fully* **guaranteed**

FREE

POSTAGE ON ALL U. S. A. ORDERS.

with all purchases over $1.00 your choice of (1) Utility Knife, (2) Model Water Sprayer, (3) Choice of 3-20" Model Plans—Curtiss, Heathe, Boeing, Driggs, Bellanca, (4) Masking Tape, (5) Sandpaper 12 sheets.
MINIMUM ORDER—50c

SHIPPING INSTRUCTIONS: Packing cost on all orders 10c, 36" or 5 ft. 20c. To packing cost add 15c% postage for U.S. possessions, Canada, foreign countries when order is over $1 and 15c if under $1. 5 ft. packages to Canada shipped Express Collect. Minimum order—50c.

SKYWAY MODEL AIRCRAFT SUPPLY CO., 426 SIXTH AVE., DEPT. M, BROOKLYN, N. Y.

gear wire and are bolted to the firewall with 2-56 machine screws and nuts. The two lower clips and attaching screws also hold the lower ends of the engine mount braces. These are 3/32 O.D. brass rod or welding rod. The lower and upper ends are flattened and drilled 3/32", and the upper ends are held by steel roundhead screws, 3/8" long. Note that on the lower ends of the landing gear, a "U" clip is bound on with wire and soldered. This is a means for attaching the stiff-paper fairing, which we will tell of later.

At this point we should wire our model for the ignition. Since it has been our experience that most model builders have their own favorite ways of wiring their models, only a general idea will be given as to the ignition wiring. Note the batteries are carred in a cradle, which consists of two pieces of flat 1/16" balsa about 2 1/8" wide. We also carried our coil with the batteries, and the assembly of both was glued directly to the cradle when the proper center of gravity was determined. Booster plugs, if used, should be mounted one on either side of the cockpit, where they are easily accessible. If a flight timer is used, it can be installed on a dashboard glued inside the cockpit and forward of the opening, where it can be easily seen. The condenser is best mounted on a small piece of balsa glued between the engine mounts approximately as shown. The rest of the wiring is pretty much up to you.

Next will come the planking of the fuselage. Medium balsa 1/8" x 3/8" is used. Cowling and fuselage planking should all be done at one time to insure neatness and a good fit of the cowling. Make a temporary bulkhead of the same shape as Station 1 1/2 and cement it in place. When gluing on the planking strips, run the strips from this bulkhead aft to Station 12 11/16 or 23 3/4 whichever the case may be. The underslung cowling portion is not very difficult to make, and it adds something worthwhile in looks, which is worth the trouble. You can vary this to suit your personal taste, and the engine you happen to use.

Sand all the planking down to a minimum of 1/16", coat with several coats of dope. The front portion of the cowling is made of soft balsa blocks with the grain running in the various directions as shown in the sketch. Glue it to the bulkhead, but not so well that it cannot be cut off, and shape to contour shown. If you use an engine other than a Brown Jr. you may have to make some variations over this design, but those changes are an opportunity to express your ingenuity in cowling design, and should not be considered as something which has to be done. Dope this well, when dry and sanded, cut off the forward portion and split the cowling into several pieces, each of which is cut out and sanded out to a wall thickness of 3/32" to 1/8". Glue all parts back together and cut in the cooling, exhaust and crankshaft holes. Coat this well with dope and set aside for the time being. To finish the skirt proper of the cowling, cut it with a sharp razor blade around the firewall. Break loose the Station 1 1/2 bulkhead, and clean up this skirt wherever necessary. Cement the forward portion of the cowling on and dope the cowling well. For ease in removal and accessibility to the engine, the cowling is cut into halves at Station 4. The cowling is held on by 3/8 flush-head screws which screw into four white pine blocks glued to the firewall, and a filler block of white pine cemented to the outboard sides of the engine mounts. Eight screws are used in the rear portion of the

ANNOUNCING

SOL TOUBIN'S

Midtown Model Craft Hobby Store

Model Airplanes — Motors — Ships — Railroads — Supplies

NEAR 6TH AVE. ONE FLIGHT UP PH. WI 7-3427
57 WEST 35TH ST., NEW YORK CITY

Radial or Lug Mounting—Improved Crankcase

Now standard equipment on the

MARVIN

CLASS A

Better than ever in **1942**

The Best MARVIN Ever Built

Improved design—at no increase in price. Diamond bored cylinders, honed to .0001 running clearance. Pistons ground to extreme accuracy and individually lapped. Each motor individually tested, run in on its own power and *easy to start*. Can be inverted. For long life, superior performance and all around satisfaction you can't go wrong when you select a MARVIN. Present low price subject to change without notice. Order today.

ORDER TODAY

$9.95 Postpaid

Complete with coil and condenser, assembled and tested. Prepaid where full payment is received. Shipped C.O.D. plus postage on receipt of $1.00 deposit.

Guaranteed

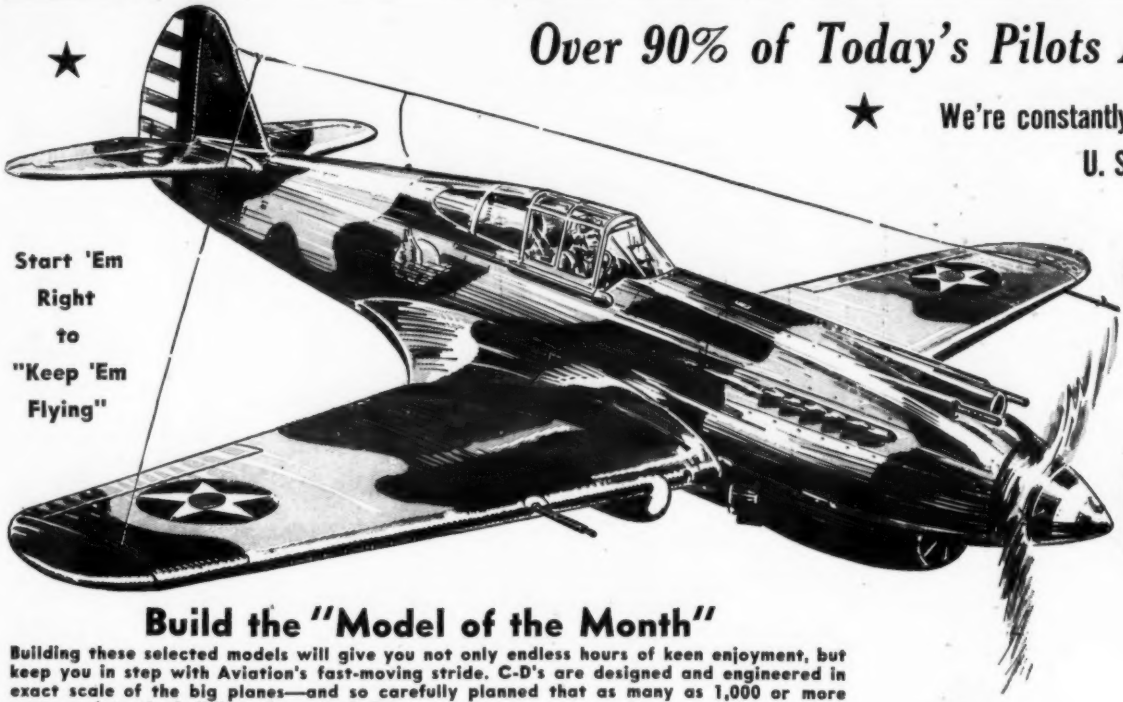
Each Marvin carries our guarantee protecting you against all defects in materials and workmanship.

Literature on Request

MARVIN MANUFACTURING COMPANY
644 Vermont St., Royal Oak, Michigan

Many of Today's Air Victories High Over the Pacific and Europe *Began Years Ago* . . . with the Building of Model Airplanes!

★



Start 'Em Right to "Keep 'Em Flying"

Over 90% of Today's Pilots Are Former Model Builders

★ We're constantly receiving orders from men of the R. A. F. and U. S. Air Corps for these world famous C-D Models —"America's FIRST LINE of Flying Models"

Get the Most Out of YOUR Precious Model Building Time by Building

CLEVELAND MODELS

Build the "Model of the Month"

Building these selected models will give you not only endless hours of keen enjoyment, but keep you in step with Aviation's fast-moving stride. C-D's are designed and engineered in exact scale of the big planes—and so carefully planned that as many as 1,000 or more parts go into the building of many of them.

CURTISS P-40 "TOMAHAWK"

In the export version of the P-40, which is known as the Tomahawk, this design is reputed to equal or better the performance of the famous English Spitfire. Our model for this design follows the very latest refinements as illustrated above. Due to the long, projecting nose, it makes an excellent scale flying model. No present-day lineup is complete without this 28½" span beauty. Colors are supplied. Instructions for camouflaging are also given on the well detailed C-D drawing. Complete Master Kit No. SF-77 only $3.00

They Win ★ More Compliments, More Honors, More Prizes Than Any Other Line of Models in the World

AN AVIATION MILESTONE C-D DESIGN

Cleveland's Newly Adopted Emblem for Master Scale Models

well detailed C-D drawing. Complete Master Kit No. SF-77 only .....

3—

Any Other Line of Models in the World

Adopted Emblem for Master Scale Models

BRITISH SPITFIRE

This realistic Cleveland model of the "Pride of the RAF" is the pride of any builder. Beautiful 27⅝" model of England's popular interceptor fighter. Large wing area makes this an excellent flyer. Speedy.
Master Kit SF-73..... **$3.00**

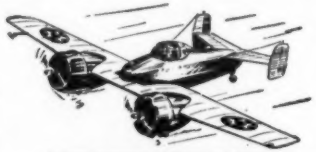
LOCKHEED P-38 "LIGHTNING"

The world's fastest fighter, so fast that you don't hear it, they claim, till it's past you, beautifully modeled. Span 38¾". A superpowered twin motor model that's speedy, realistic and an absolute "must" among model builders who want the newest and best.
Master Kit SF-85..... **$4.00**

"CANNON-PLANE"

AIRA-COBRA

Striking 25½" model of the plane that is fast coming to the front as the U. S. A.'s and England's standard pursuit interceptor. Due to its long projecting nose, it's a perfect high speed flyer. If you prefer, the 2-wheeled Airobonita may also be built from these plans.
Master Kit SF-76 ..... **$3.00**



GRUMMAN SKYROCKET

Beautiful 31½" authentic scale model of America's new twin motor 450-mile-per-hour "Terror of the Skies." It's fast. It's spectacular! It's the envy of every modelbuilder! Both motors pull—and how! Its popularity has been instantaneous, so don't delay building it. Strikingly colored silver and yellow. Complete Kit SF-75, only **$3.50**

There's More Fun, More Education in Building ONE Cleveland Master Model Than DOZENS of Ordinary Models!

All Cleveland SF and D models shown on these two pages are "Master" Models. Engineered to ¾ or ½" scale, they are practically a twin in miniature of the big planes they represent, their prototypes. Yet withal, because of the extremely clear instructions and simplicity of design, they are not difficult to build. Kits are all the new improved type.

Biggest $1 Model in the U. S.

35" MARTIN BOMBER. Kit D-45, **$2.50**

IT'S HUGE! 7 FT. SPAN

CLEVELAND CONDOR Soaring Glider. Span 84". Class D or E. Soars for hours Kit E-5019 ..... **$1.00**

CLEVELAND EAGLET Soaring Glider, Span 48". Class C. Kit E-5018 ..... **50c**

CURTISS GOSHAWK F11C-2, Span 23⅝". Kit SF-49 only, **$3.00**

★

41¾" DOUGLAS TRANSPORT. Kit D-55, **$3.00**

SEVERSKY P-35 Fighter. Latest version is known as "THUNDERBOLT" Kit SF-61.... **$2.50**

Build and Fly the "Supercharged" PLAYBOYS and these other Contest-Winning GAS MODELS

All Gas Model Kits Complete Except for Power Unit

Huge 82½" STINSON RELIANT (2" scale). America's Most Popular Radio-Controlled Design. Kit GP-66... **$12.50**

The Playboy in Flight

PLAYBOY SR. Class C Gas. Huge 80" span. Breaking records everywhere. 800 sq. in. Kit GP-5017 (except motor unit) **$4.95**

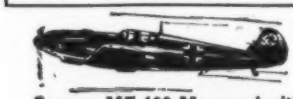
PLAYBOY JR. Class B Gas. Span 54½" (360 sq. in.) Kit GP-5006 (except power unit) **$2.95**

BABY PLAYBOY Class A. For Atom motor or rubber powered. Biggest gas value on market. Span 33". Complete Kit GP-5008 (except power unit) **$1.00**

64¾" REARWIN SPEEDSTER. (2" scale.) Kit GP-69 ..... **$8.50**

52" CLOUDSTER. Class "B". Kit GP-5004 ..... **$2.95**

33" ITSY BITSY. Class A. Kit GP-5016 ... **$1.00**

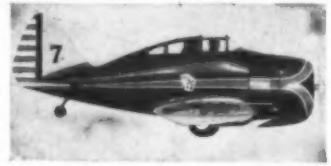


German ME-109 Messerschmitt

Sleek 24½" model of the Nazi's mass production fighter. Capable of good fast flights.
Master Kit SF-74 ..... **$3.00**

19⅝" DOOLITTLE'S G E E - B E E. Master Kit SF-27 ..... **$2.00**

23⅝" CURTISS HAWK P6-E. Kit SF-21 ..... **$3.00**



Send 5c for New #38 Airplane Catalog of all famous C-D Models.

R. R. Catalog.....5c
Ship Catalog.....5c

ORDERING INSTRUCTIONS

If your dealer can't supply you, send direct with check or money order—cash at your own risk. Minimum orders $1 (to Cuba $20). For shipments outside U. S., add 10% to those going anywhere in Western Hemisphere, U. S. Possessions, and foreign bases. Add 20% to all other countries (remittance must equal U. S. funds). For P. P., Special Delivery, in U. S. only, add 25c; (Ohio residents add 3% Sales Tax). All Prices and kit contents subject to change or cancellation without notice.

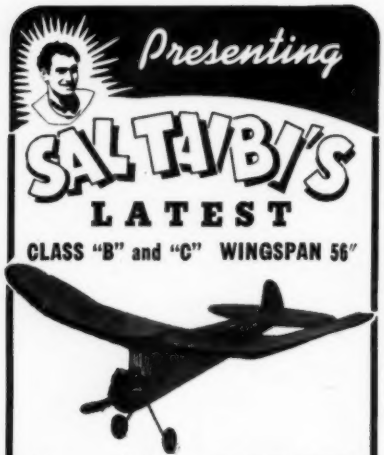
Cleveland Model & Supply Company, Inc.

World's Largest Manufacturers of Quality Model Aircraft—Since 1919

4508B30 Lorain Avenue ★ Cleveland, Ohio, U. S. A.

22½" BOEING P12-E. Kit SF-8..... **$2.00**

20" GREAT LAKES SPORT TRAINER. Kit SF-1..... **$2.00**



Brooklyn DODGER

WINNER—Skyscraper Meet—October 13—Va. Tri-City Meet—October 20—Va.

A sure first-place Pennant Winner in either Class "B" or "C" competition. Newest of Sal Taibi's gas creations. Plane has attracted so much attention with its astounding feat of 2 "firsts" in 2 meets within 7 days. "AIR TRAILS" magazine lost no time in featuring this new Double-Champion on a double-page spread. Taibi's innovation of design will enable even a beginner to construct a gas model in record time.

COMPLETE KIT: (Everything except motor) Stream-Lite Wheels, Detailed Full-size Plans, Silkspan Covering, Finished Prop, Formed Landing Gear, Printed Wood, Liquids, Dopes & Cements and Many Extras.

$3.95 POSTPAID

VULTEE *Vengeance*

Newest "V" in Britain's drive for Victory—the Vultee "Vengeance"—dive bomber. This flying scale replica by Sid Struhl even looks terrifying as the plane itself. Its advent gives England first real answer to Nazi Stuka. Ship out-performs any known dive bomber in the world today. Revolutionary secret feature enables pilot to control speed of his dive.

WINGSPAN 42" Rubber-Powered kit complete with many new H & F features. **$1.50**

Grumman SKYROCKET

U. S. Navy's twin-motor terror of the skies that attains a top speed of 450 m.p.h. That's the plane Sid Struhl followed in designing the exact flying scale model with a 42" wingspan. Its twin-props give it terrific climb, tremendous stability and no torque.

WINGSPAN 42" Rubber-Powered kit complete with instructions to build America's No. 1 ship **$1.50**

VOUGHT-SIKORSKY

One of U. S. Navy's fastest fighter planes now being used from naval carriers. Its inverted gull-wings, ultra wing-to-fuselage streamlining are designed for carrier deck landings. Features 3-blade prop.

WINGSPAN 37" Rubber-Powered kit with complete instructions to build this great Naval Plane. **$1.25**

★ ★ OTHER H & F KITS ★ ★

STINSON "105" $1.25
STUKA DIVE BOMBER $1.25
MR. MULLIGAN $1.25

H & F MODEL AIRPLANE CO.
273-M3 VAN SINDEREN AVE.
BROOKLYN, NEW YORK

DISTRIBUTORS JOBBERS } Write for special discount on the entire H & F Flying Line.

At last! PRECISION BUILT, ALL METAL MODELLERS UTILITY KNIFE
Ingenious design 'locks' 1 entire edge and more than 70% of blade surface into sliproof, buckleproof working position! Assures hair-line-precision workmanship.
On Your Dealers Counter
with a SLIPROOF DOUBLE-EDGE Cutting Blade
UTILITY KNIFE
is a versatile, all-purpose tool for modellers, mechanics, artisans, etc. Blades reversed or replaced in a jiffy. (JOBBERS: Write for attractive set-up.)
10¢
AT DEALERS
BY MAIL: 25c coin brings SKYWAY UTILITY KNIFE plus 2 extra, dubl-ej blades. (incl. postage).
SKYWAY MODEL AIRCRAFT SUPPLY CO. Mfrs. 426-A 6th Ave., Bklyn, N. Y.
6" TIP TO TIP
2 KEEN EDGES
SLIPRUF—BUCKLEPRUF
EX. BLADES 2 for 10c

cowling and four in the front. Note that five tabs of balsa are shown at Station 4; these serve to line up the edges of the cowling at this Station.

The streamlines for the landing gear may be put on at this time, and the cabane can be finished. Note that in Section C-C, balsa sheet, 1/8" thick covers the cabane top and bottom and all sides to make a flat section which fits into the recess in the wing. After streamlining the struts and putting the finishing touches on the cabane, cut out the recess in the wing to match the cabane. If you have worked well the bottom surface of the cabane should be flush with the bottom of the wing. Insert some hard balsa shear pins and line up the wing for a fit. Incidence is your only worry here, and a variation of a degree or so can be partly compensated for by the adjustable stabilizer. However, do not be satisfied with only 1 degree of incidence. The plane was designed for 2 degrees.

The fuselage proper can be finished by cementing on the formers. After all have been glued on and dried trim them wherever necessary, so there will be no unwelcome bulges in the contour when you have put the stringers on. The stringers are hard balsa, cemented on in the given locations. Your fuselage is practically done now, only a few more details and it will be ready to cover. If by this time you have not made the rudder, you'd better get to it. Your experience in stabilizer and fin making will enable you to make it without any trouble. The fin is attached with brass strip hinges, forced into slots in the posts and ribs.

Over the landing gear struts is a fairing of stiff paper made from filing cabinet folders. They are trapezoidal in pattern, but the ends after cementing the edges together are trimmed to fit against the fuselage streamline and against the wheel. A strip of paper 1/4" wide is used to cement the rear edges together, and is shown in a typical section. After a fit has been obtained, punch a small hole in line with the nut on the U-clip. Cement a brass 1/4 O.D. washer to the fairing here, and use a 2-56 screw to hold the fairing in place. The advantages of such a fairing are obvious. It combines appearance with utility, allows unhampered movement of the wire struts in landings, and is easily and cheaply replaced when torn or otherwise damaged.

The wheels are held on by brass washers, soldered to the ends of the axles; thus the wheels can never come off at unexpected moments, but they can be easily removed by melting off the soldered washers.

ENGINE INSTALLATION: The engine is mounted inverted. A Brown Jr. was used in the original, and was a perfect engine for this model; however, any engine similar to it in size and power can be used. There is no offset used in the line of thrust whatever. It is our opinion that this is a makeshift remedy, and should not be used except when necessary to correct some flight characteristic peculiar to certain models.

After you have checked your engine over carefully and tested it, take it out and also remove whatever you can from the airplane preparatory to covering and doping.

COVERING AND DOPING: The model is covered with a lightweight silk, paper is not recommended because it is difficult to handle. Start with such flat surfaces as the fin, rudder and stabilizer before covering the wing and fuselage. The fuselage is the hardest to cover, but a little care will insure a good job. Two coats of clear dope on a dry, warm day will suffice to tighten the fabric. Sand off the airplane with some fine sandpaper.

The color scheme is, of course, that of the U. S. Navy; chrome yellow top wing and tail surfaces, red rudder and fin and band around fuselage and wing chevron and black lettering and details. The remainder is silver white or aluminum. If you do not wish to use aluminum, a gray-white dope may be used without impairing the appearance. After doping, cement on the windshield and assemble your model.

FINAL CHECK AND SPECIFICATIONS: Run the engine in the completely assembled plane for some minutes, then check for any looseness of wire joints, tie rods or engine mount braces or the adjustable stabilizer. Incidentally, it does not pay to run the engine with all the cowling on, so do not fly the model with it on. The rear half may be kept on and still allow easy access to the engine and parts.

Well, good luck and many flights. We feel sure you will be proud of this model.

Specifications

Span, 69 1/2"
Maximum Chord, 11 7/8"
Wing Area, 703.6 sq. inches
Length Overall, 43 1/4"
Tail Span, 26"
Tail Chord (Max.), 10 1/4"
Stabilizer Area, 197.2 sq. inches
Fin Area, 48.8 sq. inches
Weight (Total), 3.8 lbs.
Wing Loading, .75 lbs. per sq. foot
Power Loading (1/5 hp.), 19 lbs. per horsepower

VICTORY

START 'EM FLYING

★In these times of national emergency you can do your part by learning the theory of Aviation. ☆ Invaluable training is yours by the experience you gain by participating in the building and flying of gas models. ☆ Phantom Motors, realizing this have made every effort to give you only the finest equipment at a price you can afford. ☆ The Phantom P.30 operates on the same primary theory as a real airplane motor. And is designed to give you years of worthwhile pleasure. ☆ May we suggest you order a P.30 today, and lay the groundwork for a career in aviation tomorrow.

P-30 Specifications 1/5 h. p.; 2 port 2 cycle; .710 bore; .750 stroke; .295 cu. in. displacement; bare weight 5¼ oz. Vacuum feed downdraft carburetion, will not siphon tank dry. ¼" crankpin; bronze bearings. Turned steel cylinder; lapped alloy steel piston; new patented principle of by-passing, eliminates piston deflector. Cylinder and by-pass one integral part; full ⅜" crankshaft; square rotary valve port; oversize anti-friction bronze bearings; lucite plastic gas tank; Champion V-2 spark plug; enclosed condensers; die cast connecting rod. Smith coil. Timing cam integral part of crankshaft. Hollow steel alloy crankshaft. Visible gas capacity. Motor built to be used upright or inverted. Gas tank can be mounted on either side of fire-wall. Newly designed connecting rod. Large ground steel piston pin. Needle valve conveniently mounted, clearing prop.

☐ Money-order enclosed

☐ New Phantom "P.30" complete with coil, tank, condenser and prop spinner $9.75

☐ Phantom "P.30" flywheel $1.25

☐ Send C. O. D.

☐ New Phantom "P.30" complete with coil, tank, condenser and flywheel $10.50

☐ Special 12 inch hardwood propeller . . . . 49¢

NAME_____

ADDRESS_____

CITY_____ STATE_____

Foreign Countries 75¢ extra *Add 3% in California*

PHANTOM MOTORS ★ 800 EAST GAGE AVENUE LOS ANGELES, CALIFORNIA

Train by Flying the Fleet Trainer

(Continued from page 25)

they will have to be made from scrap balsa and string.

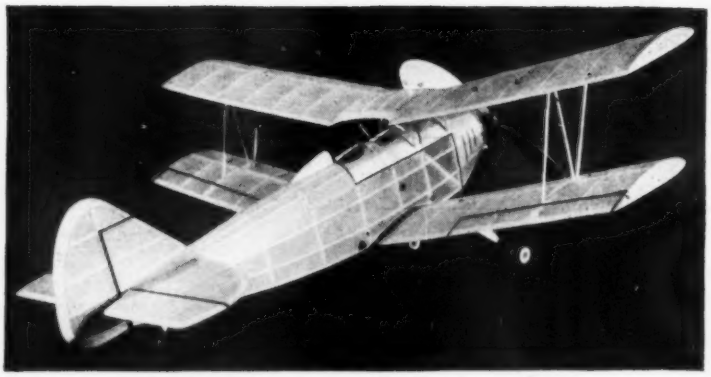
Bend the landing gear to required shape from .038 music wire. Bind the landing gear to the bottom fuselage cross members with sewing thread. The wheels are cut from 1/4" sheet balsa and are 1-1/2" in diameter. Cement a large copper washer on each side of the wheels to act as a bushing. Black dope is used to simulate the tires. Slip the wheels on the axles and put a drop of cement at the end to keep them in place.

Make the cockpit from one piece of 1/16" sheet balsa, wet in hot water, then bend and cement in place.

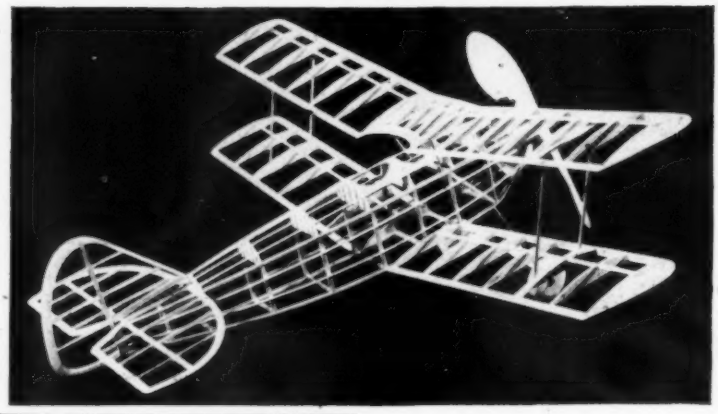
Cover the fuselage in the usual manner, it is advisable to use Silkspan for this purpose. Use one piece of covering material for each fuselage side. Color scheme is, of course, optional but we covered our model with orange paper, for details silver and black. Leave a section of the fuselage bottom uncovered to allow for installing new rubber motors. Spray the covering with water, dry and then brush on one thin coat of clear dope. Add the celluloid windshields and the fuselage is complete.

WINGS: Plans show only the right pinions so it is necessary to draw the other half of the wing plan.

Cut all the wing ribs as described in the plans. Note that the two innermost ribs on the lower wing are cut from 1/8" sheet balsa for extra strength. Build the wings directly on the plans for easy construction.



Realistic, with sufficient dihedral for stability
Construction is simple yet sturdy



It's a SNAP
to start your "OK"
NEW
For race track and boat basin
SUPER POWER "49"
Class "C"
Complete with exhaust stack, coil, plug and condenser $15.50
Consistent
Flip an "OK" engine over once or twice—and up she roars! You'll never get shut out because of balky starting—a thrilling "run for your money" every time! Their sturdy, rugged appearance inspires confidence—their magnificent performance—consistent under all conditions!—has made them a prime favorite with the best-known, prize-winning experts in the field! The next time you visit your dealer give an "OK" your critical "double-o" (once-over!)
There's an 'easy to start' OK for
AIRWAY-RACEWAY-MARINE
TORNADO ..... Displ. .604 cu. in. $24.00
'49' ..... Displ. .493 cu. in. 15.50
SPECIAL ..... Displ. .604 cu. in. 15.50
DE LUXE ..... Displ. .616 cu. in. 19.50
'OK' TWIN ..... Displ. 1.208 cu. in. 40.00
"OK" TORNADO
Especially designed for race track & boat basin
It Breathes Power
Bore .900; Stroke .950; Disp. .604
Complete, incl. coil, plug & condenser $24
HERKIMER TOOL & MODEL WORKS
HERKIMER, (Dept. M-3) NEW YORK

Pin the stock in its proper location on the plans and cement the ribs, then the 1/16" x 1/8" spar. After the cement has set add the 1-3/4" dihedral in the top wing. The wing tips are cut from 1/8" soft sheet balsa; trim to shape.

Cover the wings in the usual manner. It is necessary to apply dope only to the extremities of the surfaces, since the bottom camber is flat there is no need to apply dope to the ribs. Treat the wing covering similarly with water and dope as with the fuselage.

Make the wing struts from bamboo strips to plan size. Insert the ends of the center section into the fuselage longerons in the position shown. Push the other ends into the center section ribs at the proper angle. Cement these joints securely. Now add struts to the upper wings and allow cement to harden. Scrape the paper covering from the bottom fuselage longeron where the lower wing meets it. Cement the lower wing to the fuselage longeron and insert the wing struts into the wing ribs making sure there is 1-3/4" wing dihedral.

TAIL SURFACES: Tail surfaces are simple to construct, made directly on the plans. The stabilizer is fashioned in one piece for strength.

All stock is cut from 1/8" light balsa. Pin the members on the plans and then cement ribs in place. Sandpaper the leading and trailing edges to a streamline cross-section.

Cover the stabilizer with Silkspan and treat the covering with water and one coat of clear dope. Thin strips of blacked, doped to the surfaces, are used to show the control

ATTACK

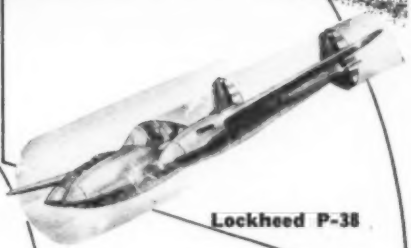
with MODELCRAFT WAR PLANES . . .

This country is all through thinking and talking about *defense*. From here on the word is ATTACK. Model builders wanting the latest and fastest Fighting Planes—ships that are making American history—are referred to Modelcraft's list of fighters below. Also mentioned are outstanding flying models of commercial and civilian type. *You can get them now* at your dealer's—or direct.

Barney Snyder

North American Mustang

Bell Airacobra



Lockheed P-38

25c ADD 10c POSTAGE

N. American Mustang	20″
Brewster Buffalo	20″
Lockheed P-38	19″
Boulton Paul Defiant	20″
Hawker Hurricane	20 1/2″
Pacific Ace	20″
Black Bullet	20″
Soaring Glider	30″
Ryan Sport	20″
All Balsa Glider . . .	Class B

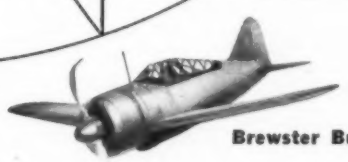
35c ADD 10c POSTAGE

Bell Airacobra	25″
Curtiss P-40	25″
Spitfire	24″
Messerschmitt 109	30″
Junkers Stuka	25″
Pacific Ace	30″
Super High Wing	30″
Puss Moth	30″
Stinson 105	30″

60c ADD 10c POSTAGE

Lockheed P-38	38″
Vought Navy Fighter	36″
Aeronca C 70	40″
Rearwin Speedster	40″
Cloud Haunter	40″
Albatross Glider	45″

ON SET OF ANY 6 ADD JUST 30c POSTAGE



Brewster Buffalo

Get BIGGER *Values from*

MODELCRAFT

Largest Supply House in the West

7306 SOUTH VERMONT ★ LOS ANGELES, CALIFORNIA

"Here's how!" SAY THE
X-acto boys

KEENER KNIVES
RENEWABLE blades
Here's the one knife that's sharp forever! New blades . . . only 10c each and instantly replaceable. Eight different made-shapes for any kind of cutting or carving. Buy an X-acto today at your dealer's . . . or a complete kit of 3 knives and extra blades. Be all set for any cutting job. Sets from $1.00 to $3.50.
X-ACTO CRESCENT PRODUCTS COMPANY, Dept. MA, 440 4th Avenue, New York, N.Y.

¼ TURN RELEASES
¼ TURN LOCKS in NEW BLADE -new knife ready!
50c
X-acto
GIVES all HOBBYISTS THE WORLD'S SHARPEST KNIVES!

surfaces.

Cement the stabilizer and rudder in place making sure they line up perfectly with the thrust line.

PROPELLER: To get best flight performance from your model it should be equipped with an efficient propeller. A medium hard balsa block 1" x 1-1/2" x 8" is required. Shape the blank as shown in the plans and then carve a right-hand propeller. Cut the back face of the blades first with about 1/16" undercamber. Sandpaper until the undercamber is completely finished. The uppercamber is cut away with care as the thickness becomes critical. Now trim the blades to an elliptical shape as seen in the photographs; then balance.

Bend the prop shaft from .038 music wire and slip it through the nose plug and through several washers and finally through the prop hub. If a winder or free-wheeling device is used, bend a loop in the end of the shaft; otherwise bend the end of the shaft at right angles and force it into the hub.

If reasonable care has been taken in the construction of the Fleet Trainer you may use as little as six strands of 1/8" flat brown rubber; otherwise eight strands will be needed. Your model is now ready for initial flight.

FLYING: Test the model over deep grass but if none is available make the first test flights R.O.G. with but a few hand turns. In all probability your ship will be a little tail heavy. If so, add a small weight to the nose block. Once the balance is obtained gradually increase the number of turns, feeling out your ship's characteristics. Offsetting the thrust line to the right or left will aid in controlling the degree of circle in either direction. For maximum flight performance stretch the rubber motor and wind with a mechanical winder.

The Fleet Trainer is a fine little biplane addition for your collection and if the plans are followed with reasonable care it will provide many hours of flying thrills.

VICTORY

The Gangsters' "Big Gun"

(Continued from page 22)

L. Martin's B-10 and B-12 bombers, the U. S. Air Corps announced a competition for twin engine bombers from which emerged the equally famed and still used Douglas B-18. In this competition was the Martin 166, an improved version of the B-10 later exported to Turkey, the Netherlands (for the Indies) and various other nations. That these Dutch models later found their way to Tokyo cannot be other than conjecture coupled with reproduction of the type as Type 19 by the Nakajima firm, with certain modifications.

Type 19 was first produced in 1938 as a commercial transport and thus its type designation rather than Type 98 Army designation under which it is undoubtedly classified. As such it carried pilot, copilot and accommodations for five passengers. That it was intended, even originally, as a bomber is certain for its nose carried a glass-enclosed turret. The following year it was pressed into military service, the passenger seats ripped out, a rear gunner's cockpit mounted aft and bomb racks installed. As such it is now seeing duty in the War in the Pacific and as such it is quite likely it appeared over Manila.

The wing structure is a development of the Douglas DC-2 although altered somewhat in plan form. The structure is full cantilever of stressed skin design and features elliptical tips, no longer used in this country. The ailerons are all-metal fabric covered, balanced both dynamically and statically. Split trailing-edge flaps are provided, built up of metal sheet riveted to suitable half-ribs.

Fuselage is full monocoque construction, flush riveted throughout. It is slightly oval in cross-section and tapers sharply to the rear. The lower forward portion is flat to provide for the bomb bay and doors, giving the ship an unconventional inboard profile. The skin covering is of a special light aluminum alloy known as "kaijochome," a poorer quality than that used in this country and consequently used in much heavier sheets.

The tail surfaces are full cantilever with an unbalanced rudder (unbroken hinge-line) and balanced elevators. Trimming tabs provide aerodynamic balance for both surfaces, however.

The landing gear is the standard Douglas DC-2, 3 double-piston type in which the wheel is suspended between two vertical shock absorbers. Landing gear legs break forward in the middle raising the wheel up and forward into the engine nacelle. A rear member supports the structure. Balloon type tires are used to provide improved ground handling ability on rough or unimproved fields. The tail wheel is also standard Douglas design comprising forged fork and shock-absorber leg mounted within the fuselage to bulkhead fittings. It is not retractable.

The Type 19 is powered by two Mitsubishi Type IV engines of 870 hp. each. According to information received here the Army model is powered by two Wright "Cyclone" type R-1820-G nine-cylinder radial air-cooled engines developing 1,000 hp. for takeoff. This seems quite possible as negotiations with the Wright firm in

OUR "LINES" ARE HOLDING!!!
We, Too, Have The 'Situation' Well In Hand
TO KEEP 'EM ROLLING

A real stream-lined, sponge rubber wheel. Scientifically constructed will NOT "fold up" on landing. ¼" wide at hub. Class "A," "B," or "C" jobs. 45c (PAIR)
Pervel
REG. U.S. PAT. OFF.
American Made FABRIC-TYPE Paper
All the qualities of silk at a fraction of the cost! Can be cemented, sewed or doped. Suitable for any jobs. White only! 3 24"x36" sheets. 25c By mail, add 5c
"SIL-KEE, JR." Another American paper triumph! NOT A SUBSTITUTE, DEFINITELY SUPERIOR TO ANY FOREIGN MAKE! Light but strong, for rubber or "A" and "B" gas jobs. Shrinks evenly, without wrinkling. Helps colored dopes give high lustre. White only. 6 sheets. 25c
LUSTROID PRODUCTS
"FILM SEALED"
Hermetic sealing prevents leakage, evaporation or drying of contents.
2¼ oz.
Cement, Dope or Thinner 4 oz. Can 25c 15c
COLORED DOPES

Lustre finish: Red, Dark Blue, Army Blue, Yellow, Green, Orange, Brown, White, Black, Grey or Khaki. Double the quantity at nearly 1/3 price. Tested and approved by BUREAU OF STANDARDS of foremost Dept. and Specialty Stores. 2¼ oz. Bottle 20c 4 oz. (can) 30c

40 PAGE ILLUSTRATED ENCYCLOPEDIA MODELLICA
Over 1000 items with much technical data, helpful construction tips, charts, etc. PLANES, ENGINES, TRAINS, RACE CARS, SHIPS, SUPPLIES, ACCESSORIES. Coin or stamps. 10c
INTERNATIONAL MODELS (MA-3) 254 West 55th St. NEW YORK, N. Y.

Paterson, N. J., were undertaken at the time the firm purchased the Douglas DC-2 transport. However, no definite information as to the licensing of Nakajima for Wright engines manufacture is available. If these engines are used in the Army bomber most assuredly they are being manufactured in Japan, for they have not been available even to private American consumers for nearly two years. Once a manufacturing license is issued to a foreign power and drawings and tools forwarded it becomes quite impossible to prevent their manufacture after diplomatic relations have been severed between the two governments. However, the foreign firm can manufacture only the engine for which it has drawings and Japan most certainly is not manufacturing the newer 1,500 and 2,000 hp. Wright engines now installed in U.S. military planes.

This same identical situation exists in regard to the Hamilton Standard three-blade constant speed propellers used on the Type 19, licenses issued at the time of the DC-2 purchase.

These propellers are protected by conventional de-icer "spinners" mounted against their face in such a manner that de-icing fluid is thrown out along the blades through use of this "slinger ring".

Engines are mounted in long chord cowls equipped with cooling flaps at their after circumference. Exhaust ports are located outboard of each engine and lie flush with the nacelle. The oil cooler air scoop is located below the engine cowling; carburetor air intake is mounted within the upper engine cowl.

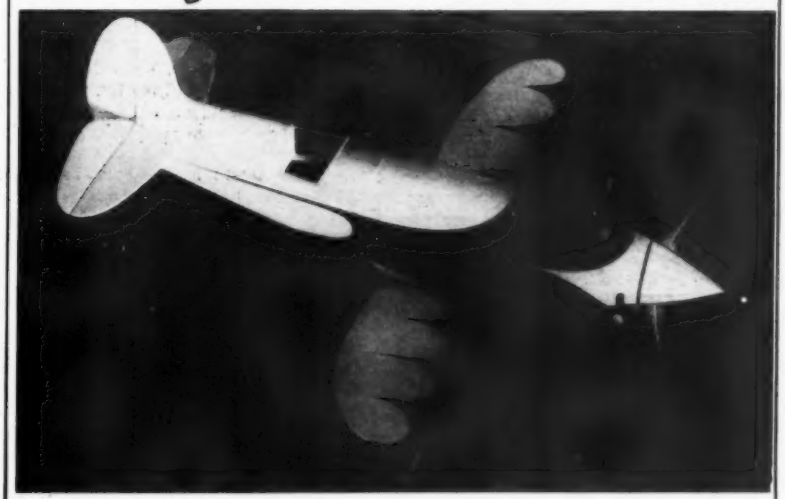
The Nakajima Type 19 bomber has accommodations for crew of four to seven depending upon the mission. The forward fuselage portion is glass enclosed with extreme forward panel carrying machine-gun swivel mounting; nose gunner is located within this compartment in an obviously cramped arrangement although probably no task for the wiry, obedient Japanese gunner. Immediately aft is the bombardier lying prone and sighting through a glass panel immediately under the gun sight. Lateral view is provided by a series of small glass windows.

Pilot and co-pilot are situated in a conventional glass enclosed cabin-type cockpit with but one unconventional feature: ingress and egress are provided through the enclosure top which swings to starboard to permit passage of the crew. This would indicate the size of the bomb bay insofar as there is not passage for the pilot from rear to front or vice-versa.

The rear gunner is situated atop the fuselage just aft of the wing trailing edge in an enclosure identical to that on the Martin B-10 type bombers. The cockpit has a windshield halfway between the two cabins with glass hatches extending rearward over the cockpit and terminating in a folding enclosure. In action, this requires raising the after portion and movement of the entire structure forward to provide access to the guns. In the B-10 arrangement, a hatch was mounted within this enclosure through which the navigator might take necessary observations, and it is likely this has been followed in the Type 19.

The bomb bay is located between the

SUPER "G" LINE FLYING
ENTIRELY NEW & DIFFERENT
PATENTED
Stunts Galore
Super Speed
Full Control
Announcing The SUPER "G" SHARK



IT'S HERE, A Sensational New Directional Control System, SUPER "G" LINE FLYING and a Sensational New Elevator Type Control Model, The SUPER "G" SHARK, illustrated above. Especially designed for Super Speed and Stunt Flying, this Mighty Shark roars through space at speeds of over 100 M.P.H. Yet, so simple in construction and operation that even the beginner will experience no trouble. May be powered with any class "C" motor, such as the Ohlsson "60's," the Tiger Aero, the Super Cyclone, etc.

The New Super "G" Shark Construction Kit is a Prize-Winner. Contains plenty of fine quality, carefully sawn Balsa Wood, Hardwood, Plywood, Printed Parts, Cement, Dope, Covering Paper, Spring Wire, Streamlined Wheels, Super "G" Line Control Parts, etc. Together with a large fully detailed plan and instructions for building and flying.

COMPLETE $3.95 KIT
POSTAGE 30c

REGULAR "G" LINE & FREE-FLIGHT MODELS

BABY SHARK SUPER SPEEDSTER

COMPLETE $1.98 KIT
Postage 20c

The new BABY SHARK, Super Streamlined Speed Ship, is designed for all Class A and B motors. This snappy little job flies at tremendous speeds of from 50 to 75 M.P.H.

INTERCEPTORS UP

TIGER SHARK SPEED DEMON

DELUXE $4.95 KIT
Postage 30c

The TIGER SHARK, Super Speed Demon, is designed for all ½ H.P. motors. It roars through the air at unbelievable speed of from 60 to 90 M.P.H.

Fly the Sensational New INTERCEPTOR, Super Performance Class B Free-flight model. Tremendous climbing qualities. Kit unusually complete.

$2.98
Postage 30c

SHARK P-60 "G" LINE MODELS
New Rubber Power Kit Two Gas Power Kits
Build and Fly one of these thrilling new ARMY TYPE PURSUIT "G" Line Speed Ships. All Kits are unusually complete throughout.

Complete Shark P-60 Kits
Rubber Power Kit Complete $1.95 Postage 20c
For All Class A & B Motors $1.98 Postage 20c
For All Class C ¼ H. P. Motors $2.98 Postage 30c

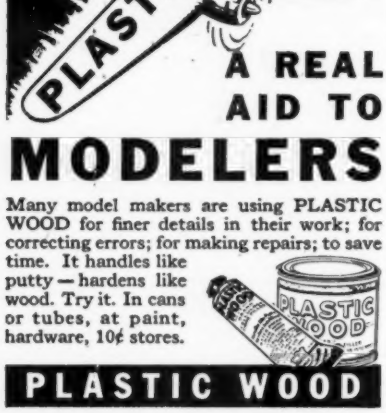
DEALERS WRITE FOR DISCOUNTS — DESCRIPTIVE FOLDERS 5c
VICTOR STANZEL & CO., Dept. M., SCHULENBURG, TEXAS

A REAL AID TO MODELERS

Many model makers are using PLASTIC WOOD for finer details in their work; for correcting errors; for making repairs; to save time. It handles like putty—hardens like wood. Try it. In cans or tubes, at paint, hardware, 10¢ stores.

PLASTIC WOOD

A Star Fixer!



Holds *tight* on wood, china, glass, celluloid. Makes quick, lasting repairs. Excellent for model airplane making! TRANSPARENT OR METAL COLOR.

(SEE PAGE 63)

IN YOUR MAIL BOX

every month for 12 consecutive months—several days before your own newsstand gets copies. Convenient isn't it? your copy of

MODEL AIRPLANE NEWS

reserved and delivered to you—and at a *saving*. Why not subscribe now? Send $2.00 *today!*

Fill in This Coupon and Mail

MODEL AIRPLANE NEWS,
551 Fifth Ave., New York

Enclosed find $2.00. Send me the next 12 issues of MODEL AIRPLANE NEWS.

Name .....

Address .....

City ..... State.....

two cockpits and must extend the complete height of the fuselage as mentioned above. Bomb doors hinge outboard to permit the fall of bombs.

Within the fuselage aft of the pilot-copilot compartment is located the radio operator or utility mechanic as evidenced by several small windows over this area.

A novel feature of the Type 19 is use of a combination air-speed head and radio antenna mast located on the starboard side just above the pilots' compartment. This arrangement has been used extensively in this country aboard long-range Navy flyingboats as well as commercial clipper ships.

A hydraulic system operating at only 500 pounds pressure (1,000 lbs. used in the U.S.) is provided, obviously making hydraulically operated mechanisms function slowly, among which are landing gear, wing flaps, cowl flaps and bomb bay doors.

Complete electrical equipment is carried maintained from the battery charged by engine-driven generators. This system is the two wire type now considered dangerous in this country. A dynamotor provides current for radio receiving and transmitting apparatus. Japanese radio equipment is extremely out-dated by present standards and aircraft radio is of extremely low power, indicating it is used for inter-plane communication only, rather than ground-to-air messages. This latter would be of little use in the War in China, insofar as bombing missions were and are carried out with little or no opposition, obviating the necessity for warnings of enemy aircraft approach.

Type 19 carries an extremely large oil supply totaling 200 litres (53 gallons) suggesting a large oil consumption, quite likely with use of low-grade oil now forced on Japanese Airforce planes. Fuel capacity is 1,000 litres (264 gallons) carried in two inner panel tanks and two nacelles tanks. The plane has a wingspan of 72 feet 2 inches (22 meters), is 50 ft. 9 in. long (15.48 meters), stands 11 ft. 11 in. high (3.65 meters) with a wing area of 675 sq. ft. (62.7 square meters).

It weighs 10,450 lb. empty and 15,860 lb. fully loaded, of which 4,000 lb. is bomb load. A variety of bombs can be carried within the spacious bomb bay from two large aerial type torpedoes to literally thousands tiny incendiary bombs. It has a wing loading of 23.5 lb. per sq. ft. and power loading of 7.93 lb. per hp.

The original commercial model had a top speed of 217.3 m.p.h. with 870 hp. engines and cruised at 186.3 m.p.h. Naturally, no figures are available for the military model, but the Martin 166, after which it was copied, had a top speed of 260 m.p.h. and cruised at 205 m.p.h. Between these two figures must lie actual performance figures of the military type Nakajima bomber, possibly as high as 250 m.p.h.

Cruising range is 2,484 miles (4,000 kilometers) sufficient to have participated in the Manila and Hong Kong offensives from bases in Formosa and China.

According to every reliable source this is the latest and standard bombing plane used by the Japanese Airforce, and is in many respects a formidable weapon indeed. Its armament includes machine guns mounted in the nose, aft above the fuselage, and aft below the fuselage quite probably only 30 caliber weapons as no news of 50 caliber machine-guns has been received from China. This being true, it is poorly defended from modern standards and easy prey for Uncle Sam's fast Curtiss P-40 fighters in the Pacific. It is the type bomber which might well cost many lives and much property damage among undefended cities, but, with aid of proper timing and recognition, highly vulnerable to either ground or air defending forces.

VICTORY

Modeling the World War Spad

(Continued from page 7)

Rickenbacker's famed 94th Squadron was completely outfitted with them. Some say it was not as maneuverable as the older Nieuport, but it was steadier and stronger and in a dive, "a streamlined brick!"

Rene Fonck, greatest of the French "Aces," who accounted for 126 enemy planes, brought down six Huns in two hours! Probably the greatest air fighter of them all, Fonck was invincible in the Spad. So was Guynemer! He shot down 19 enemy planes with "Old Charley," his favorite Spad—and he painted the name on the white fabric of "Old Charley," so all who met him knew they had met France's immortal Guynemer.

When you World War fans read the Spad had a top speed of 135 m.p.h.—only to see in other places that it was slower than that, cheer up! No two aces will tell you the same thing about the plane; power outputs varied with different motors, and speed varied accordingly. As for altitude, it is interesting to read that Rene Fonck fought one duel at 20,000 feet, much higher than most Spads could fly.

Praise for this World War I fighting ship has never been so lavish as that bestowed upon it by Edwin C. Parsons, writer and technical consultant for the "movies." Parsons flew with the French and is credited with eight victories. He says there was never a better plane than the Spad. "Flat-winged, with only a little safety factor, the Spad," Parsons writes, "had a considerable inherent stability and was easy to fly. The vaunted Fokker D-7 could climb a little faster and go a little higher, but in a dive, the Spad had no equal." Parsons dove one at 225 m.p.h. in an aerial duel—and no Fokker could "pull out" at that speed without losing a wing; and that was often the difference between life and death to many an American pilot.

Power unit was the Hispano-Suiza engine, a Spanish engine that saw war service in French and British planes alike. The 1917 Spad, equipped with the 150 hp. model, was not as fast as later ones with more powerful engines. The model most American aces flew was built around the 220 hp. Hispano-Suiza, and is credited with a top speed of 135 m.p.h. Twin Vickers machine guns were mounted in the fuselage over the engine, firing through the propeller. Rickenbacker writes that jammed guns often meant a hurried exit out of a dog-fight for a Spad pilot. If guns jammed, the pilot was in trouble and had to get home to fix it.

For you mechanics, here's a sidelight

KEEP "EM" FLYING with Berkeley

With our America now at war, more than ever, the training of the youth of our country in the use of their hands and minds is the first line of defense. Berkeley Models backed by the finest engineering skill in the world are producing model kits for America. Berkeley has already contributed to national defense by giving designs to be used in the mass production of target planes. Sinbad the Sailor is produced as a full-size glider for the Army Air Corp.

BUCCANEER "B" SPECIAL

Featuring Stall-Proof Slotted Wing and Spin-Arresting Tail

56" Wingspan

$3.95 P.P.

This newest BUCCANEER gives you the ultimate in safe, stable super-performance. The ideas incorporated in this ship are the result of the latest N.A.C.A. Wind Tunnel Tests. No more whipstall or spins due to improper adjustments with the BUCCANEER "B" Special, the only gas model with wing slots and spin arresting tail. Power it with any Class "B" or small Class "C" engine. Kit includes finished propeller, rubber wheels, formed-landing gear. .....**$3.95 p.p.**

BUCCANEER "C" Special

Complete Kit with Timer (less wheels) **$5.95 P.P.**

6 Ft. Wing
2 lbs. Complete

The cabin contest model that approaches design perfection. Rugged construction gives the "Special" the highest weight-strength ratio of any model. Spin arresting stabilizer setting. A glide ratio that exceeds wind tunnel calculations. Your best contest bet in Class "C". Kit is complete with Silkspan, dope, and Flight Timer. **$5.95 p.p.**

SUPPLY DEPARTMENT

NEW AD-A-CELL BATTERY BOX
Cut Battery costs 60%. Use two to six cells. Perfect for weight rule contests and balancing model.
$1.25 p.p.

GENUINE "T-56" BROWN RUBBER
Genuine Fresh stock purchased under Government Priority Ruling for Model use only.

1/8" —25 ft. for 15c	$1.00	per 225 ft. skein
3/16—25 ft. for 25c	1.40	per 225 ft. skein
1/4" —25 ft. for 30c	1.90	per 225 ft. skein

FLO-TORQUE PROPELLERS
The choice of champions. America's most popular gas model propellers.

INVADER 8" to 14"—Sanded Whitewood	15c
AIR SCREW 8" to 14"—Mahogany Stained and Lacquered	25c
"35" 8" to 15"—Super performance. Stained and Lacquered with Rubber Finish	35c

IGNITION EQUIPMENT

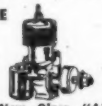
Smith Competitor Coil	$1.95
Aero Feather Weight Coil	$2.25
Champion Spark Plugs all types	50c
Metal Case Condensers	25c
Flight Timer	$1.00

GAS MODEL WHEELS

2 " Sponge Rubber Wheel	pr. 40c
2½" Sponge Rubber Wheel	pr. 45c
3½" Sponge Rubber Wheel	pr. 60c

MOTORS FOR IMMEDIATE DELIVERY

Class "A"	
Super Atom	$15.50
Dreadnaught "19"	12.50
Class "B"	
Rogers KD-29	4.95
Rogers RMC-2	7.95
Cannon "300"	16.50
Class "C"	
Cannon "350"	18.50
O.K. Special	15.50
Bunch Tiger	18.50
Ohlsson 60 Special	18.50



New Class "A" Dreadnaught "19" Rotary Valve, Aero Spark Coil. Super Power $12.50
Immediate Delivery Guaranteed

BERKELEY "PREMIER" BALSA
Recognized throughout the world as the finest balsa obtainable. Over 150 stock sizes listed in the Berkeley Catalog.

MAIL ORDERS
Latest Catalog, 10c, at your dealer or direct Mail Orders: If your dealer cannot supply you, order direct. All mail orders insured. Add 15c packing charge on orders less than $1.50

AMERICAN ACE
Henry STRUCK Design

Ace "36" 36" Wing
For Atom and Elf engines. Just like the 54" Ace, this ship turns in performance with the midgets that will amaze you.
COMPLETE KIT $1.50 P.P.

AMERICAN ACE "54"
54" Wing
Holder of the National Class B Record on Land and Sea. Henry Struck Designed. For all engines .19 to .49 displacement. All over the whole U.S.A. the AMERICAN ACE is smashing records and winning contests. The most popular gas model in America today because it is so easy to make perform. No tricky adjustments necessary, just snap on the wing and she takes care of herself. Complete kit with silk, finished landing gear, rubber wheels, liquids and hardware. **$3.95 P.P.**

THE SKYROCKET

36" Wingspan Class "A" COMPLETE KIT $1.95 P.P.

A new departure in class "A" contest designing, featuring a one wheel landing gear, high lift airfoil, and polyhedral wings. This ship incorporates many aerodynamic principles used by contest winners throughout the country. The Skyrocket has proven itself by taking prizes at both the National and Eastern States Contests.

KIT INCLUDES: Everything to build model as pictured. Silkspan covering; cement and clear dope; hardware and ignition equipment; rubber landing wheel; and all wood parts printed out. .....**$1.95 p.p.**

SINBAD THE SAILOR

$1.00 at your dealer 10c extra by mail.

50" Wingspan

Another Henry STRUCK design. This tow-line launched glider equipped with Spiral Control is capable of unbelievable accomplishments. The simplicity with which you can launch makes Sinbad a real contest winner! The ease with which you can build the ship will amaze even the most experienced builders. Complete kit.

BANNER "SPORTSMAN"

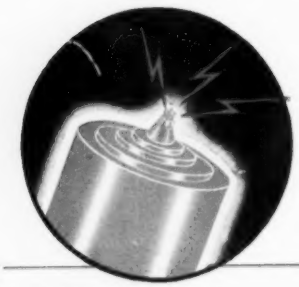
30" Wingspan

COMPLETE KIT **50c P.P.**

A beautiful and easily built model with the appearance of today's most popular sport planes. Flights of 1,000 feet or more are not uncommon.

BERKELEY MODELS INC. 230 STEUBEN ST. Dept. M 4 BROOKLYN, N. Y.

RED HOT
IGNITION
for Instant Starting
Longer Motor Life



Smith FIRECRACKER
COIL

- Genuine Bakelite Case.
- 20,000 (twice the usual 10,000) turns of wire.
- Complete coil impregnated under vacuum with highest grade insulating compound—NOT just the outside wires!
- Integral machined terminal.

DEVELOP the *full* potential of power from your motor with *Smith* ignition. Demand a genuine Smith Coil, the kind used by experts since gas model flying began. For aviation, automotive, and marine models.

Smith Firecracker, 2½ oz...$2.75
Smith Competitor, 1½ oz... 1.95
Smith Big Shot, 5 oz..... 3.00

STANDARD OF THE MODEL WORLD

Have you ever noticed the number of high grade motors that come EQUIPPED with Smith Coils? Yes, there is a reason—DEPENDABILITY.

SMITH COILS
IGNITION
NATHAN R. SMITH MFG. CO.
105 Pasadena Avenue
SOUTH PASADENA, CALIF.

on the "jams" that forced many a Spad "peelot" out of the fight: The gun was built into the engine and the tripper bar tripped directly from the port cam shaft which operated over the feed-block cover. A double feed or any jam occurring in the feed-block necessitated a partial dismantling of the engine before the feed-block could be freed. This could not be done in the air, so, it was "duck and run." When a "double feed" was forced by the tricky drum, your only salvation lay in hasty exit.

The advent of another European war proved upsetting—a "World War hobby" is a big enough order without having two wars. But at the same time, it provides interesting comparisons. For instance, the 1940 Spitfire packs eight guns and can hit 367 m.p.h. Later models carry cannon, too, and top 400. Retractable landing gear, instruments by the dozen; what a difference from the days of the Spad—with its chunky landing gear, stubby wings and struts, the flying wires! The modern fighter flies about three times as fast, and yet, another generation may see speeds that will make 1940 look like a sissy! Well, that's progress!

Most of the pursuit planes used by both sides during the "Big Scrap" had the single-bay arrangements; in other words, one set of struts at each end of the wings. The Spad, however, had the characteristic two-bay wings arrangement, which not only makes it easy to "spot" for us fans—but gave the plane its strength.

The scalloped appearance along the trailing edges of the wings was due to the use of wire instead of wood. The same goes for the tail. So be careful when you make your model; incorporate the "scallops."

The stories of the men who flew the Spad could be made into a volume. Aviation was just beginning in 1914, and the gallant heroes who flew into flaming skies during the World War gave this flying game a tremendous boost. There was Guynemer, the idol of the French; the pale, sickly young man who blazened a trail of glory through the skies—and who one day disappeared. Some say his plane was demolished in mid-air by a direct hit from an "Archie" battery. Others say he was shot down in a dogfight and that his plane and he himself were destroyed by enemy shellfire.

Rene Fonck, another famous French ace, piloted his Spad to many victories. Eddie Rickenbacker, American Ace of Aces, downed many an enemy plane and balloon near the end of the war—and he appreciated his Spad. Frank Luke, the "Balloon Buster," electrified his fellow-countrymen with his daring exploits in a Spad. Many times he would tell his buddies to watch a certain enemy balloon at a certain time—and sure enough, at the appointed minute the balloon would be brought down under Luke's blazing guns.

There are many other well-known Americans of today who can recall the war days of 1918 and some of the narrow escapes they had from the red-nosed Fokkers, the checkered Albatros, the Pfalz and other German fighters. Sumner Sewall, now Governor of Maine, was a member of the famous 95th Squadron and narrowly missed death when his Spad caught fire in mid-air. Members of the well-known writing team of Nordhof & Hall gathered material for books in the war-torn skies of Europe. And so it goes—Americans of a new generation salute their predecessors, who risked their necks, and lives, in the "crates" of years ago.

Some of us builders go in for flying models; others for "solids." The plans accompanying this article have been drawn up for the latter—for fellows who like to get detail down to the last flying wire. A popular size for solid models is the one-quarter-inch scale, allowing plenty of leeway for detail. The collection made by the writer, however, is just half that size—one-eighth-inch scale, and anyone who has done much work with that scale knows it can be hard on the eyes at times. But, whatever your favorite, if you haven't tried your luck with the Spad, get going! You'll have the time of your life!

For those with pet tricks and short-cuts for making scale models, kindly overlook any suggestions or ideas that may seem outmoded, outdated or just old-fashioned; every builder will work out his own technique, and if he follows the plans, will end up with a snappy model. The following is offered only to those who may require helpful hints.

Balsa wood is recommended for the fuselage, wing, tail and rudder. Razor-edged cutting tools are needed for carving the balsa, which should be well sanded after cutting. If exact work is wanted, make a photostat of the plans and then trace the outlines on wood before cutting.

For the cockpit: cut out a section of the fuselage where the cockpit is to go. Then work from the inside out, hollowing out and smoothing before placing the section back in. Several coats of paint will remove all traces of the cutout lines.

Landing gear: twist the end of a pin around to get your axle-hole. The other end of the pin is affixed into the fuselage and glued on. Wheels obtained from miniature train or truck sets can be used if you want the small scale job. Use another pin as the axle.

A neat stunt for obtaining the effect of ribbed wings: glue strips of thread along the top surfaces, beginning a little back from the leading edge. Cut off excess and apply paint. Several coats of paint provide a very realistic effect and give you a trim-looking job.

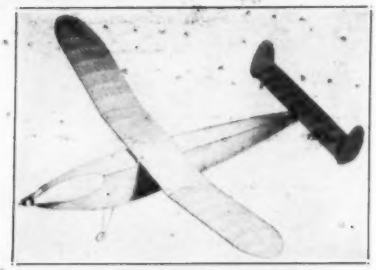
Flying wires: use needle and thread and lots of patience. If you can sew on a button, you'll find it no trouble to sew the thread in place, being sure to glue in place after tightening. Then cut off thread bits that show on the top and bottom surfaces. After several coats of paint the surface will be smooth and thread holes will disappear.

When finished you will have a model to be proud of.

Here's a hint for those who have trouble with cockpits. Cut out the entire section of the fuselage around the cockpit. Then, using a heated nail, "burn out" a hole where the cockpit goes. By using sandpaper wrapped around a pencil, you'll be able to smooth it out and get the desired effect. Then glue the section back in the fuselage and smooth it down before

and RICE MANUFACTURING COMPANY

EEP 'EM CLIMBIN
for America's sake and for
own sake. Never was it so cl
now that tomorrow belongs
expert model flyer of today
Here in the "60 Special"
new version of streamlined
power. It's an invitation to ne
perience, new training, and
thrills in big Class C flying—
nearest thing to actually being
there yourself. Whatever clas
or combinations you have pre
ously flown, get a 60 Special
Class C set-up and see what "Spe
cial" performance will really do i
your ship. Keep 'em climbing—to
new records in '42.
OHLSSON 60
Spec 18.50
★ Full .60 cubic
Class C.
★ Vital parts heat-
ish bath used on
quality precision ma
★ Piston and cylinder
1/20,000 of an inch
doubling and tripling th
precision-real".
Proved design with true
manufacture resulting in
power—unfailing dependabi
and RICE MANUFACTURING COMPANY
3340 EMERY ST., LOS ANGELES, CALIF., P. O. BOX 2324 TE
Please send latest folder on Ohlsson Motors.
Name
Address
City
State
MEMBER



ALTIMETER

SPAN—38" AREA 145 SQ. IN. WT. 4.32 OZ.

A Simple Folding Propeller You Can Make

Kit contains 28 machine cut wing ribs, notched and undercambered; 11 stab. ribs; finished trailing edges; formed landing gear; streamlined wheel; drilled and finished nose-plug; B. B. washer; dowel and plates; sheet balsa rudders; tissue; balsa; etc. **$1.25 P.P.**

BEST BY TEST MODEL CO.
175A Main St. Ridgefield Park, N. J.

STOW-AWAY BENCH!

for Modelmakers!

Get this attractive handy bench made of one inch hard wood. Ample working space. Special compartments on top and underneath for tools of all sorts. Sturdy base. Easy to put away in very small space. Beautiful natural wood finish.

Complete bench ready to use only **$7.50.** Order today. Sent postpaid.

A. J. REEK
2817 Custer Av., Pittsburgh, Pa.

Latest Developments in RADIO CONTROL

A booklet written for the radio control beginner as well as the expert. Features—"The theory of the RK-62 receiver"—"Control devices" Table of A and B batteries—A comparison of the electrical and mechanical qualities of bakelite, steatite and polystyrene—Self-neutralizing escapement—sequence solenoid rubber powered selector—rubber powered indicator—"Radio Control Circuits," an article written in answer to the questions asked in the thousands of letters received by us during the year 1941. Eighteen different radio control hook-ups with hook-up diagrams.

Ask your dealer or send twenty-five cents for illustrated Instruction Manual. Stamps will not be accepted.

Radio Control Headquarters
330 West 42nd St., New York City

NEW BOAT READY!

BUILD OK-4 at home in a Few Evenings!

WRITE for big illustrated **FREE** Circulars!

Mead's sensational new 14-foot portable Outboard KI-YAK OK-4 carries 4 adults and duffle—takes motors up to 9 H.P. oars and sail. Weighs only 75 lbs. Seaworthy, dependable. Biggest, lightest, strongest of its kind! You can build yours easily, quickly, perfectly at home in a few evenings from our patented, complete construction kit and save nearly HALF! Big money assembling, selling to others. (3 other paddle-sail KI-YAKS from 18 to 45 lbs. . . . also OK-2 for motor, sail, oars . . . weights 50 lbs.) Double paddle or oars now included with your Kit. Write for Free, lavishly illustrated circulars, low-factory-to-you prices!

MEAD GLIDERS, 15 So. Market, Dept. K-32, CHICAGO

painting.

Scalloped trailing edges can be acquired by wrapping a small piece of sandpaper around a brush or pencil. Use light strokes to avoid breaking the balsa wood edges.

With a model like the Spad, where the lower wing is flush with the fuselage bottom, glue the wing on before assembling the entire wing section.

The best results in struts can be obtained by using pins, these can be stuck through the balsa wood wings—glued into place. Then use nippers and a file to remove the pin sticking out above and below the wings. If struts are wider, glue a thin strip of wood behind each pin. Painting will make it appear as one unbroken line. It's best to paint all surfaces before assembly, with the exception of the top wing's upper surface and the bottom wing's under surface. This leaves time for filing down pins. Then apply the paint, or lacquer or dope, until a smooth finish is acquired.

The following information, sent us by Colonel Rickenbacker, will help you with the color scheme:

"The fuselage was a two-tone green camouflage. Landing gear and tail surface had the usual Army markings. Wings were of a cream colored fabric with the Allied colors in circles (Red, White, and Blue—red on the outside and white in the middle). The private marking (on Rickenbacker's Spad) was a Hat in the Ring with Number One. The struts were yellow, propellers mahogany, and the trailing edges of rudder and stabilizers were scalloped."

VICTORY

National Indoor Fuselage Winner

(Continued from page 13)

for at least one hour before taking it off the form.

TAIL SURFACES: Tail construction follows the system just mentioned except that stabilizer spars are made from two pieces with their centers tapered. To obtain the special taper shown, mark the center line of the tip on a 14" long, 1/32" sheet. Sand the sheet to taper given. Then cut a taper from 1/20" at end to 1/32" at center (actually the tip) and then again to 1/20" at the other end. Make two, then sand round. Wet the strips and bend around the template. Cement ends at center, and carry on as with the wing.

The rudder is built in like manner. It might be a good idea to start with the rudder and see how handy you are in bending balsa.

COVERING: The surfaces are covered in one piece. Use a 38" loop of microfilm for the wing. Lay wing on a flat surface and make a faint pencil outline around it.

Moisten the outside portion of the surface with wet towel. Wet with saliva spar tips and ribs where dihedral occurs, and replace the wing within the moistened circle. Position film over wing and bring it down. Blow and pat the film against the outside areas, and against the spars if it fails to contact the framework. Make sure there are no cement strings on your fingers or you might tear the film. Don't touch the wing for about an hour, and then trim excess with hot wire, allowing about 1/8" film for melting. Tail surfaces are covered in a like manner.

Set up a dihedral jig with blocks to give the correct dihedrals. Nick spars about half way through at center and tip dihedral spots. Bend or crack spars at these points until proper angle is obtained. Apply cement and set on jig. Take up film slack, caused by dihedraling, with hot wire. Leave wing on jig and put away to age for about a week.

FUSELAGE: Build two sides over the full outline drawing, with wax paper to prevent sticking. While cutting uprights make four of each, full-dimensioned, to insure equal sizes. In assembling the sides, cement end first and then work forward, cementing every third upright. Make sure that lineup is true by checking over drawing, then fill in the in-between positions. Cut 5/64 strips from superfine with sharp razor and steel edge. It is immaterial in what direction the strips are cemented, though be sure the bracing is smooth and tensioned without pulling the framework out of line. Use clear dope for cementing.

The fuselage is completed by filming. Moisten the side to be covered by dipping ever so slightly into water, then placing the fuselage on the microfilm, pressing gently where needed to bring the film and frame into contact. By wetting the entire side, the paper strips tighten and hold the entire film in place. Trim and repeat for the other sides, drying completely before attemping further work.

Cut blank to shape from 1/64" stock, sand to proper weight, wet and roll around a tapered hardwood form. Bake in oven

HAWK ¼" SOLIDS

KIT No. 13 B/J SEAPLANE

Kit contains body, rudder, elevator, and wings sawed to outline shape, die cast propeller, turned cowl where required, 2 bottles of paint, tube of cement, wheels and insignia.

50c KITS

No. 10 F.E.2 B.
No. 13 B. J. Seaplane
No. 23 Supermarine
No. 74 Lockheed P-38
No. 77 Curtiss P-40
No. 78 Grumman Skyrocket
No. 80 Stuka Bomber
No. 85 N. A. Mustang
No. 86 Curtiss Dive Bomber
No. 88 North American 68
No. 89 Gloster Fighter
No. 90 Douglas Attack Bomber

NOTE:—Add 10c for postage and handling on each kit ordered—or 5c per kit when you order 2 or more. Send 10c stamp for complete Catalogue.

HAWK MODEL CO.
DEPT. 8M
3521 Fullerton Ave. Chicago, Ill.

GRUMMAN F3F1
U. S. NAVY SHIPBOARD FIGHTER

32" Span. Length 24". 1" Scale

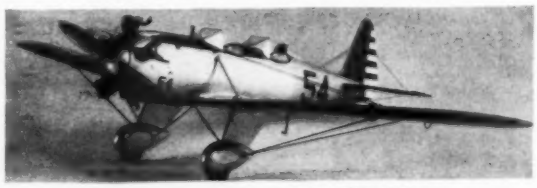
A fine detailed model with retractable landing gear, 4" turned balsa motor front, 3 oz. grey dope, ½ oz. yellow, 2 oz. glue etc., all parts printed on balsa, 10" propeller, wheels, rubber motor, full size drawing, and all parts. This fighter plane is used in large numbers on the aircraft carriers. Const. Set complete, postpaid. **$3.75**

CURTISS HAWK F11C4 PURSUIT NAVY

32½" Span. Length 22¾". 1" Scale. Weight 6 oz. Color grey, top wing yellow

THE MOST EXCLUSIVE AND FINEST EQUIPPED MODEL IN THE WORLD. MOVEABLE CONTROLS WORK FROM COCKPIT. A special de luxe model, one of the most beautiful ever made. Set contains a 4½" scale Wright Cyclone celluloid motor, detailed push rods, fins, etc., like real motor, 4½" aluminum cowl, 10" steel type carved prop shown, 2⅛" wheels, tail wheel, star and rudder insignia and lettering, rubber, windshield, instrument board, flying wires, 4 aluminum step plates, aluminum wing walks, ready cut wheel pants, washers, 3 oz. grey paint, ⅛ oz. yellow, ½ oz. red, 2 oz. glue, etc. All other parts are printed on balsa wood 33"x44" scale drawing. Const. set, complete in labeled box, postpaid. **$4.50**

NEW RYAN PT21 ARMY TRAINER



30" Span. Length 23". 1" Scale. Weight 3 oz.

A special feature of this model is its fuselage, which is completely covered with sheet balsa, then with tissue—giving it a beautiful appearance. Model has movable controls from cockpit. Set has all parts printed on balsa, set of paints, rubber, wheels, full size drawing, etc. Set, postpaid. **$3.00**

BOEING B-17 FLYING FORTRESS BOMBER

44" Span. Length 30". Color, silver. Weight 6 oz.

Set has all parts printed on balsa, four 2" turned balsa motor fronts, four 4" carved props, celluloid wheels, set of paints, glue, and full size drawing. Set, postpaid. **$4.50**

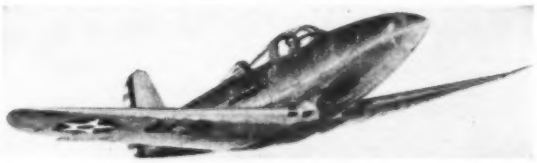
De luxe set with 4 aluminum cowls, 4 celluloid motors, 4 metal props, and 2 M & M air wheels. Set, postpaid. **$6.25**

NEW MARTIN B26 U. S. ARMY BOMBER

40" Span. Length 35". 1/8" Scale. Color silver

A beautiful model of the world's fastest bomber. Set has all parts printed on balsa, propellers, wheels, insignia, set of paints, glue, full size drawing, and all parts. Set, postpaid. **$4.75**

NEW BELL P39 AIRACOBRA PURSUIT



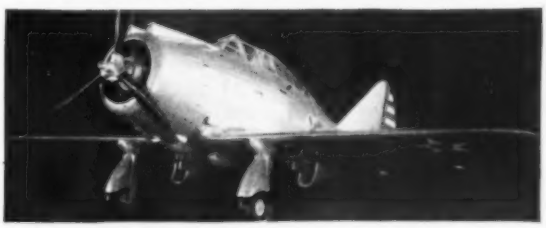
34" Span. Length 30". 1" Scale. Color silver.

Exact in every detail of the real plane. This is the most perfect copy of the P39 on the market. Set has all parts printed on balsa, 3 oz. silver dope, 2 oz. glue, black, etc., turned wheels, insignia, rubber, carved propeller, full size scale drawing, and all parts. Set, postpaid. **$3.50**

9 FOOT TAYLORCRAFT GAS MODEL

Set has ready cut wing ribs, gear struts, nose piece, etc., set of paints, dope, glue, etc. Model weighs 3¾ lbs. without motor, suitable for radio control. Lifts 4 lbs. additional weight. Full size drawing. Const. set, postpaid, less wheels and motor. **$15.00**

SEVERSKY P35A ARMY PURSUIT



32" Span. Length 25". 1" Scale. Color, Silver

Set has 4" turned balsa motor front, 10" carved prop, balsa wheels, tail wheel, rubber, all parts printed on balsa, 3 oz. silver dope, ½ oz. black, 2 oz. glue, etc., insignia, and full size scale drawing. New improved model has retractable landing gear and movable controls from cockpit. Set, postpaid. **$3.25**

36" Span. Weight 2 oz. Lanzi built flying model. Ideal for clubs. Motors and all parts. Set, postpaid. **$1.50**

TAYLORCRAFT

CURTISS F11C4 SOLID MODEL

10½" Span. Length 7½"

This is a special de luxe solid model. Set has completely finished balsa fuselage, cockpit cut out, routed pants, wings cut to shape, 1½" de luxe cast motor, alum. cowl, 3 bladed cast prop, paints, drawing and all parts. Set p.p. **$1.50**

NEW! 1942 CATALOG 10c

CURTISS P36 ARMY PURSUIT

37" Span. 1" Scale. Color, silver

Set has turned motor front, set of paints, glue, all parts printed on balsa, and full size drawing. Set, postpaid. **$3.25**

Set with 4" celluloid motor and aluminum cowl, postpaid **$4.25**

BOEING F4B4 NAVY FIGHTER

Solid Exhibition Model

22½" Span. Length 14½". ¾" Scale.

Set contains completely finished balsa fuselage, with cockpit cut out, and headrest attached; all you have to do is paint it. The wings, tail, and rudder are all cut to shape, but have to be sanded to proper curve. A 3" celluloid motor with aluminum motor front, 3½" tapered aluminum cowl, 7" scale propeller, wheels, complete set of colored paints, glue, filler, and full size drawing. Set, postpaid. **$4.50**

MINIATURE AIRCRAFT CORP.

83 DANIEL LOW TERRACE
STATEN ISLAND, N. Y.

Generously Filled Kits. No Skimpin'

NATIONWIDE 'C' CHAMPION

"PACER"

SAL TAIBI'S ORIGINAL PACER 'B' $3.95 POST PAID

The original model 53" span, 371 sq. in. area (Pacer "C" scaled up from this!) Most consistent performer of its kind! Simple to construct, skillfully stressed to take toughest flying incidents. Built in adjustments. Sharp right turn under power, slow left circle in glide, easily controlled turn "rides" every riser! For use with any 'B' or small 'C' engine.

PACER 'C' 60" wing-span, 45" length, 4 sq. ft. area. Complete kit. $4.95 PP

STREAMLITE WHEELS—SILKSPAN in Pacer Kits

First Small Ship in Gas Model History

'MIKE' $1.49 At dealers or direct (postpaid)

Ideal design for new gas-modeller! Plenty of thermability! Originally introduced at $4.95! Kit contains everything (except wheels) in liberal quantities.

West of Mississippi, increased shipping charges. Add 10% to Price

BAY RIDGE MODEL AIRPLANE and SUPPLY CO.
"Champion Plane Kits"
4419 3rd Ave. Brooklyn, N. Y.
MORGAN MODEL SUPPLY CO. (Coast Dist.)
7220 S. Western Ave., Los Angeles, Cal.

to obtain a dry and stiff job.

Construct plugs as shown, making sure they fit snugly. Note down and left thrust on the nose plug, accomplished by drying the front washer completely, and then, with a piece of wire as a line-up aid, setting the rear washer until the desired thrust line is obtained. Mark the top portion with an arrow to aid in correct plug-in.

Make landing gear as shown in one unit before cementing to fuselage, then cut and shape the various pieces that make up the wing mounts and cement in place.

ASSEMBLY: Assemble the tail unit, fix plug to boom and make line-up certain. Cement stabilizer to the boom with fuselage sides as line-up. Cement rudder to the boom, and finally the landing gear. Form a cement socket around the landing gear strut and longeron. Put work aside and get ready for prop carving.

PROPELLER: Try to get the lightest possible block being easiest to carve to given weight. Be methodical and sure of every step. Note the blank outline giving extra blade area where it is most needed, and also quarter grain surface on both blades. Carve undercamber first by cutting the surface so that it is flat from edge to edge. Then mark 1/3 behind the leading edge. Cut away front portion to a depth of 1/8" at center of the blade. Then carve off the trailing edge portion. Smooth with medium grade sandpaper and finish with 10-0. The under surface should be completely finished so be sure both blades are exact as it is dangerous to come back after the upper surface is done.

Carve away the upper portion until the going seems dangerous. (Be sure to keep knife razor edged for best result.) Sand over milk bottle to thinness which will give almost the correct weight. Now cut the outline by template, bevel centers as shown and cement together. While cement is still wet, place a wire between the joints for shaft hole. After the joint is thoroughly dry, remove the wire by twisting and so breaking up the cement surface. Now, on a bottle, sand the top surface to final weight. The ideal prop should have a gradual thickness taper from center to tip, and the true airfoil camber. When the prop is complete, balance, insert and cement the shaft in place. Pass the free end of shaft through plug, with two polished washers in-between. Then bend end to shape as shown.

Make wing struts as shown. Be sure to be generous with cement and allow enough time to set. Cement struts to wing 1/4" from center to give left wing extra lift area for counter-torque. To line-up the aluminum clips, insert a piece of 1/20 sq. in both. While struts and clips are setting, cement the upper strut and make clips for lower bracing.

Fix four temporary balsa struts between wing spars and center longerons, for steady and warpless wing position. Apply top tungsten first. Start from front tip break to center post, and then carry it to the rear of the opposite pinion. Repeat with the remaining side. Lower Bracing: Start at tip break, carry wire to the "s" hook under the center of the wing, and then back to the trailing edge of the tip break, making sure there is no slack. Repeat with the other side. Hold wire to "S" hooks with spot of cement. Remove temporary bracing, and the model is ready for flight. Note: The wash-in, wash-out may be varied by moving the "S" clips along the bracing.

On the best flights, a 22" loop of 3/32" special brown was used. Possible turns vary with conditions, about 2300 turns were used on record flights, although capable of 2,700. However, this just about kills the rubber and it must be replaced every third flight. Be sure to use good grade of lubricant. It is understood that the rubber is prewound before official flights.

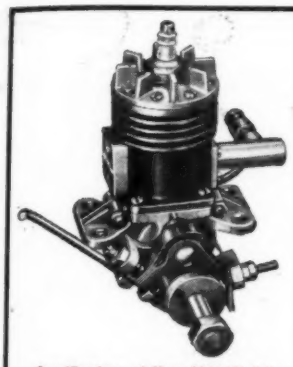
Your success will depend a great deal on workmanship and how closely you are able to duplicate weights. Next in importance comes adjustments made during flying. Do not hurry. If the model is close to the original, the wing will set at about the spot shown. If you must shift for balance, note that incidence varies. The incidence should be 3/16" to 1/4".

The natural flying tendency is to the left, the original model gave no trouble so no special precautions are necessary for this design. With the contest winning, record background of this design it is quite possible that your ship may be the 1942 National winner. If not it's not the fault of the writer!

VICTORY

SINCE 1911—YOUR BEST SOURCE FOR QUALITY
Ideal Models
PLANES
BOATS
MODEL R. R. EQUIPMENT
IDEAL'S True-Cut KNIFE 10c by mail, 5c extra
Write Today for Your Copy of Our Big Catalogue—10c
Ideal Aeroplane & Supply Co., Inc.
IDEAL AEROPLANE & SUPPLY COMPANY, Inc.
20-24 WEST 19TH ST. NEW YORK
On the Pacific Coast: MODEL BOAT & AIRCRAFT CO., 1356 5th Ave., San Diego, California

A REAL GASOLINE ENGINE $5.95



Here is your opportunity to buy a kit of the famous G.H.Q. Gasoline Motor. ABSOLUTELY COMPLETE — ALL MACHINING DONE—READY TO ASSEMBLE. All you need is a screw driver. No mechanical knowledge required.

The only nationally advertised kit that includes a coil, condenser and wires.
Identical Engine Less Coil and Condenser $4.95

Specifications of New 1942 Model

4 Port 2 Stroke Cycle. ¾" Stroke. 15/16" Bore. 300-7,000 R.P.M. Bearing Surface, 1¼" Long. Crankshaft, 5/16" Diam. Rotation, Either Direction. May be run Inverted. 1/5 Horsepower. Class C under NAA Rules.

Everything is in the kit, including Champion spark plug, COIL, CONDENSER, tank and cap, ignition wire, cylinder, piston, connecting rod, timer, crankshaft, all screws, nuts, bolts, simple illustrated instructions, etc. Every part is fully machined and finished. A SCREW DRIVER IS THE ONLY TOOL YOU NEED.
EXACTLY THE SAME PARTS THAT GO INTO THE G. H. Q. ASSEMBLED ENGINE.

ALL PARTS FINISHED & GUARANTEED

30 MINUTES TO ASSEMBLE

Imagine operating your own G.H.Q. 1/5 Horse Power gasoline engine—small enough to fit in the palm of your hand—yet turning up over 7,000 revolutions per minute and powerful enough to fly model airplanes of from 4 to 10 foot wingspan, and propel model boats from one to six feet in length and midget cars that travel over fifty miles an hour! There are also hundreds of other ways you can enjoy using this miniature yet powerful power plant—for small pumps, generators, compressors, blowers, fans, grinders and countless other experimental purposes.

This engine has been tested and proven over the last eight years. Over sixty thousand of these powerful little G.H.Q. engines are now in actual daily use. Why not join the ranks of these hobbyists?

FREE!!

Send for free circular or 6c for circular and loose leaf Jumbo catalog of hundreds of model plane, boat, car and hobby items.

ENGINE IS COMPLETE AND READY TO ASSEMBLE!

Your engine comes to you with every part completely finished. Our factory trained skilled mechanics, using the latest automatic precision machinery, have finished each and every part to the last detail. You merely assemble the parts in accordance with the few simple instructions given, using only an ordinary screw driver, and inside of thirty minutes your engine is ready to operate.

Not only will you and your friends have the thrill of seeing an engine ASSEMBLED BY YOURSELF operating, but you will gain a knowledge of gasoline engine theory and practice that will be of real practical value to you.

15,000 SOLD IN THE LAST YEAR

FACTORY ASSEMBLED READY TO RUN $6.95
—complete with coil and condenser—

60,000 SOLD IN THE LAST 8 YEARS

How To ORDER: Send only $1.00 We Ship Coil. C.O.D. Same Day

G. H. Q. MOTORS, Inc., Dept. M, 40 East 21st St., New York, N. Y.

Model Designing Simplified

(Continued from page 9)

hold the engine, tank, coil, condenser and batteries. It is not only convenient but it necessitates less wiring than mouning each unit separately in various parts of the fuselage. Then again it is a simple matter to remove and repair it. This unit should be held rigidly to the vertical hardwood firewall bulkhead that fits against the nose of the fuselage and at its rear end, by the fuselage bulkhead C. On the back of the firewall bulkhead a balsa block can be cemented to fit snugly into the fuselage nose bulkhead, No. 1. By also fastening the landing gear to the firewall bulkhead a complete removable unit embodying powerplant and landing gear results.

Only simple structure is needed in this arrangement. Considerable stress is developed by the speeding engine or by nose-over landings, however the whole unit can be made rigid to withstand hard knocks and vibration by bracing the engine track to the firewall with vertical triangular veneer sheets. These are cemented to the sides of the engine body and to the sides of hardwood pieces fastened rigidly to the front face of the firewall. The drawing indicates this arrangement. The whole unit may be held rigidly to the fuselage by elastic bands fastened around hooks on the firewall and fuselage. The engine can be neatly enclosed by a cowling made in halves that may be quickly put into place or taken off.

The tail unit can be easily and rigidly constructed by fastening the fin directly to the stabilizer and cementing a balsa block beneath the stabilizer to serve as a bed. Small balsa blocks are cemented over the stabilizer leading edge on either side of the fin to carry rearward the streamlines of the fuselage.

Now only one problem remains to be solved: each part must be designed to withstand the stresses developed. Three things must be considered: one, material: two, the cross-section size and three, how the parts are fastened together. This operation involves knowledge of stress intensity and usually requires a certain amount of previous experience in building and flying models. A hint is given to the novice by the location of the weights of the airplane: stresses are always greatest where weights are greatest.

Thus therefore it may be assumed that greatest strength must be built into the forward part of the fuselage; in the rear part there is little stress and it should be made comparatively light.

In a plane of this size longerons, struts and diagonals of medium hard balsa 3/16" sq. will give great strength. Balsa sheet at the forward end of the fuselage sides helps to absorb the large stresses at this point. This need only be a medium strength 3/64" thick. It serves to distribute the stresses between the landing gear, motor and wing very efficiently and reduces the concentration of stresses at any one point in the frame. It is superior to paper because paper when doped creates severe tension on the frame at all times, thus increasing the stresses involved. Balsa sheet not only creates no stress but

SELLING OUT

Entire stock must go. Kits and supplies sold at cost.
Catalog, 10c
MODELS
35 Center St., New Haven, Conn.

ONE-HAND . . . .
Hobby Knife
ESPECIALLY SUITED for MODEL WORK

79¢ POSTPAID

Excellent for stripping, trimming, etc. —gives you four blade lengths (½", 1", 1½" and 2") in one handle with a mere press of the thumb. High carbon steel blade holds keen cutting edge, and handle is a durable, lustrous colored plastic. Worth much more. Order yours AT ONCE!

REFILLABLE-NIFE
Genuine razor blade —durable plastic handle.
15c POSTPAID

Utility Specialties Co., 917 N. Franklin St., CHICAGO
Gentlemen: Send me, AT ONCE,
( ) Hobby Knife @ 79c ea.
( ) Refillable-Nife @ 15c ea.
Money Order enclosed for $.....
Name .....
Address .....
City..... State.....

DESIGNED for WINNING!
ADVANCED MODELS WIN! MORE CONGRATULATIONS TO
A. R. Gunther, winner of 2nd Place, Class "C", Dec. 7th, 1941, in huge Los Angeles G.M.A. Semi-Annual Contest with Advanced VANGUARD "66" —15 second motor run—2 flights—over 19 minutes.
Arle Armstrong—winner of Fresno, California, November contest. Advanced HURRICANE "69"—877 seconds.
Jack Leight, Taft, California—with an Advanced VANGUARD "66" wins three first places, one fourth place and a seventh place in five separate contests.
ADVANCED IS TRULY THE HOUSE OF CHAMPIONS!
Advanced VANGUARD "66"
66" Wingspan
For Class C motors of .35 to .49 cubic inch displacement.
Explorer "50"—50" Wingspan For Class B Motors..... $2.95
(Plus 25c for postage and packing.)
Kit
$4.95
(add 25c for postage and packing.)
Advanced HURRICANE "69"
Class C
69" wingspan.
KIT
$5.95
(add 25c for postage and packing.)
Dealers and Jobbers, please write for our lists!
Advanced
EXPLORER "50"
A Class B Advanced model, made with micrometer accurate Green End Balsa, has a fast climb and slow glide that is amazing experts everywhere.
Wing Span: 50 in.; Wing Area: 310 sq. in.; Overall: 39 ins.
Complete kit: $2.95. Add 25c for packing and postage.
All Advanced kits contain our superlative Green End Balsa—the experts wood for outdoor flying.
ADVANCED ENGINEERING CO.
Dept. M.A., 335 Olive Ave., Fresno, Calif.
Advanced CHALLENGER "51"
Class A Junior A.M.A. National Champion.
51" Wingspan.
Kit
$2.50
(add 25c for postage and packing.)
For all Class A Motors and small Class B Motors.

adds greatly to the strength.

At the tail the stabilizer bed is dropped below the upper longerons to keep the stabilizer low and the streamlining of the fuselage more perfect. However this requires added bracing, so vertical brace blocks are cemented in the sides of the fuselage at the leading edge of the stabilizer where the upper longeron is broken. This construction gives great strength, carrying stress around the leading edge of the stabilizer without danger of breakage caused by hard landings.

The engine unit must incorporate hardwood to resist vibration or high stresses. The engine bearers should be of spruce 1/2" x 3/8". The firewall to which they are attached should be 1/16" birch veneer. The block cemented to its rear surface and which fits into the fuselage nose bulkhead should be composed of vertical and horizontal hard balsa strips as indicated. The landing gear should be made of 1/8" steel wire bent to proper shape so it can be fastened at three points to the forward face of the firewall bulkhead. This is shown on the drawing. The nose bulkhead is shown to its right; the dotted lines indicate the shape of the plug on rear side of the firewall and how it fits into the nose bulkhead.

Now a most important point in design is presented: it is a simple matter to design a model plane if only the parts to be inserted must be considered. However the great problem lies in designing proper joints. Most plane builders design structures with joints which develop only a small proportion of the strength of the parts joined. In other words, the members are much stronger than the joints themselves; consequently the weight of material does not contribute in any way to resisting stresses in the airplane. All joints must withstand two types of stresses: first, tension or pulling stress; second, shear or sliding stress.

Most joints must resist a combination of both at one time or another. Consequently straight butt joints where the end of one strut is glued, for instance to a longeron, is decidedly poor construction. Such a joint has little strength. The trick is to make the gluing area of any part as large as possible relative to the cross-section of the part. For instance in the front view of bulkhead No. 1 you will notice that the vertical side pieces are mortised or cut in so that the horizontal pieces fit snugly into them instead of merely butting up against them. This increases the gluing area of the joint considerably, helping it against shear as well as tension. In fact it helps to lock the pieces together. This procedure should be taken wherever possible. The best results can not always be obtained by beginners but through experience they will become more proficient in the art of designing joints.

Another excellent illustration of developing the fullest strength of a joint is in the fuselage strut joints. These not only butt up against the longerons but are also glued to the cross pieces joining the sides. These three parts; longeron, upright and cross piece, are all cemented together rigidly, the joint resisting tension as well as shear in all three parts. The drawing on the opposite page illustrates an efficient detailed design, though other procedures are possible. We suggest the reader study the drawing carefully to familiarize himself with all details of the structure before he starts to build.

Next month structural details of the wing outline and tail group will be given. Till then, happy landings!

VICTORY

RYAN STM-2
Contains floats and wheels to build Navy or Army version of this famous trainer.
BURKARD
GIANT
SUPER DETAILED
SOLIDS
Wing Spans to 23"
RYAN STM-2
Precise adaptations of authentic plans as furnished by the makers of the real plane! The ONLY Kit of this plane available to modellers.
Easy to Construct from
GIANT SIZE
BLUE PRINT
WORKING PLANS
CHOICE OF 12 MODELS
RYAN STM-(Illus.)
New Airacobra
Curtiss P-40
Messerschmitt
Curtiss Hawk
Grumman F3F-2
STUKO Dive Bomber
Hurricane Spitfire
New Brewster—F3F-2
Gloster Gauntlet
Boulton-Defiant
North American
Cut-to-outline shape wings, fuselage, tail surfaces. Alum. cowls (where specified), liquid, wheels, insignia, etc. At dealers or direct. Specify model.
DEALERS:
Write for dealers of "fair & square" set-up! Immediate delivery on solids or metal covered items.
$1.50
NOTHING ELSE TO BUY!
METAL COVERED
GIANT SOLID
The Last word in Miniature Realism!
The kit everybody's talking about! RYAN STM2 17½" span sealed down from approved plans. Full size photographic construction blue-prints. Everything is in the kit incl. ingenious tool for recreating rivet detail. A spectacular sight when completed!
$2.50
At dealers or direct, postpaid.
BURKARD
Model Engineering (M3)
LARCHMONT, N. Y.

Air Ways

(Continued from page 18)

and averaged 71 m.p.h. for 3 laps. The day before the contest both ships had serious crackups, causing a slight flutter on wing and tail surfaces of Carpenter's ship. He believes he can make still better time when this is eliminated. Apparently the only limit to speed of these small tethered jobs is the danger of spontaneous combustion through air friction. Both of these model

fliers are members of the Tacoma Air Screws of which Tommy Cootsana is secretary. They welcome correspondence from other clubs.

One of the most progressive clubs in the country is the Milwaukee Model Aviation Club of 2720 N. Palmer Street. One of its members, Jim Custin, sends us picture 12, showing the club's booth at the recent 3rd annual Wisconsin Hobby Exposition held at the Milwaukee Auditorium, November 20-23. The "Milwaukee Journal" was very instrumental in making this show a success. Outside of the Boy Scouts and the C.Y.O. the club's exhibit was th largest in the show, occupying a booth 60' x 10'. In all the displays emphasis was put on the educational value of model aviation. Its importance to the defense program was especially emphasized.

In the center of the picture you see a spectator intently watching reactions around an airfoil in the fluid flow tank (built by a club member, Henry Aeschbacher). This machine demonstrates streamline and turbulent flows around various profiles. Mr. Custin stands in front of the thrustometer which measures the thrust of various propellers. This was lent for the exhibit by the Kenosha Model Club.

Step by step, through such means, people are being educated to the value of model aviation as a means of instruction in science. The exhibit at the booth was periodically supplemented by exhibition flights of indoor and experimental type models, built especially for this show. These included an ornithopter, autogiro, magnus rotor and a very successful helicopter built by Robert Wood. It was estimated 30,000 people visited the booth; this resulted in the acquisition of 15 new club members.

Ohio

The following notice shows how model builders have carried activities into the large aircraft industry:

The Curtiss-Wright Model Airplane Club of Columbus, consisting of 41 employes of the aircraft company, has been chartered by the A.M.A. Besides having a great deal of fun in seeing their creations fly, the aircraft workers also have the opportunity of studying principles of airplane construction and performance.

Many younger model builders wonder how they can contribute to national defense. Here is how they do it in Toledo:

"All-out" service to the Toledo Civilian Defense Council has been pledged by Toledo Chapter, A.M.A.

President R. A. Humphreys, Sr., of the model club, in a letter to Chairman Victor A. Rosenberger of the Defense Council, offered the services of the group which includes 100 members.

Humphreys declared that members are experts at identification of different types of aircraft, both allied and enemy planes, and modelers are qualified to act as spotters in air raid service, as well as instruct other defense workers in identification.

The club voted unanimously to offer its services. Members have decided to build models of enemy aircraft to be put on display so that the public will become familiar with them, and thus be able to detect their presence.

Known as the "Toledo Model Manglers," the club is sponsored by the Exchange Club of Auburndale-Toledo. It is one of more than 200 similar youth organizations sponsored by Exchange Clubs throughout the United States. Radio, mechanics, and model flight problems are studied at weekly meetings held at Toledo's Central Y. M. C. A.

Art Rice of 2438 Auburn Avenue, Toledo sends this additional data of Toledo's activities:

"A picnic supper at historic Fort Meigs was given by members of Toledo Chapter, Academy of Model Aeronautics, for members of the Exchange Club of Auburndale-Toledo, sponsors of the model group. The modelers desired to express their appreciation to the Exchange club for providing a 134-acre model airport for club use.

"Modelers and guests heard Captain Tommy Metcalf of the Civilian Air Reserve of Toledo relate his flying experiences, and answer their many questions about aviation. Metcalf congratulated both the Exchangites and modelers for reviving model aviation interest in Toledo, and commented that 'the modeler of today is the best candidate for an aviation job, tomorrow.'

"Known among the fraternity as the 'Model Manglers,' the chapter and their sponsors now are planning the second annual Northwest Ohio Model Aviation Meet, to be staged at the new model port early next summer.

"Exchangite Gene Poague, chairman of the modelers' advisory committee, and Newman B. Thurston, past national president

Best By Test
AUSTIN-CRAFT ACCESSORIES

A. C. WHEEL COLLARS
Use these small collars to hold wheels to the axle. No soldering is required. Come with 3/32" or 1/8" hole. Specify size when ordering. Price 10¢ pair.

A. C. SOLDERING IRON
Small, Compact, ideal for using around your model. No tool kit complete without one. . . . Price 45¢.

A. C. DELUXE MOTOR MOUNTS
Stamped from heavy guage aircraft specification material. Heat treated for maximum strength.
Large size: 2½" x 3½" . . . . . 60¢ pair
Small size: 1¾" x 2½" . . . . . 35¢ pair

AUSTIN-CRAFT COMPANY
431 East Victory Blvd., Burbank, California
☐ A-C Wheel Collars—10c pair
☐ A-C DeLuxe Motor Mounts: Large size: 2½" x 3½" ..... 60c pair
Small size: 1¾" x 2½" ..... 35c pair
☐ A-C Soldering Iron—45c
NAME .....
ADDRESS .....
CITY ..... STATE M-15
• ORDERING: Take advantage of our super-fast mail order service. Your order filled the same day received. On orders under $1 add 5c postage. Remit by money order, check or stamps. PRINT NAME AND ADDRESS. No C.O.D.'s.
• DEALERS. Send on your letterhead for wholesale price list and catalogue.

WHERE TO BUY IT

Hobby Dealers: Use this Classified Directory to reach *active* hobbyists in your vicinity. Write now for special low rates. Forms for April issue close February 12.

LOS ANGELES, CALIFORNIA

PICO MODEL AIRPLANE CO.

2580 W. Pico Blvd., Los Angeles, Cal.

We carry all nationally advertised Planes, Motors, HO Trains, Boats, Race Cars.

Prompt mail order service.

Open 9 A.M. to 9 P.M.

PASADENA, CALIFORNIA

ACE MODEL SHOP

Hobby Headquarters

Complete Line of Model Supplies.

TRAINS • PLANES • BOATS • RACE CARS

Open evenings 'til 9. Phone Sy 3-6061

808 E. Colorado St., Pasadena, Calif.

NO. SACRAMENTO, CALIFORNIA

"HOBBYCRAFTS"

Leading makes model ships, airplanes, railroads, engines, race cars, books, power tools.

Mail orders filled. Try us for those hard-to-get items.

Open Evenings

1030 Del Paso Blvd., No. Sacramento

HARTFORD, CONNECTICUT

MODEL BUILDERS GUILD

—Established 1933—

You can prepare for the defense of your future as many American Pilots have by learning to build and fly Model Airplanes. May we help you with your model building problems and

"KEEP 'EM FLYING"

HARTFORD'S LEADING MODEL SHOP

Open Evenings—Tel 6-2475

81 Lawrence Street, Hartford, Conn.

WASHINGTON, D. C.

Since 1890

CORR'S

Complete Stock Airplanes - Boats - Trains - Race Cars -

Full line of motor parts

Mail orders filled immediately

812 9th St. N.W., Dept A, Wash., D.C.

ATLANTA, GEORGIA

ATLANTA HOBBY SHOP

Now Serving the Southeast in Model Kits—Supplies—Accessories for Airplanes—Railroads—Race Cars—Boats—Motors—Scenery—Architecture.

If It's a Leading Line We Have It.

604 Peachtree St. N.E., Atlanta, Ga.

CHICAGO, ILLINOIS

VISIT THE MOST COMPLETE HOBBY SHOP IN CHICAGO

Race Cars—Boats—Engines

Everything for Model Airplanes and Model Railroads

PAT SWEENEY'S HOBBY SHOP

4508 Broadway Chicago

OPEN TUES., THURS., SAT. EVE., 9 P.M.

Phone Long Beach 7251

CHICAGO, ILLINOIS

WEST TOWNS HOBBY SHOP

5727 W. Lake St., Chicago, Ill.

Leading lines of model airplanes, boats and railroads in stock.

Phone Estebrook 3272.

No parking troubles.

Open 9 a.m. to 9 p.m. daily

QUINCY, ILLINOIS

MIDDLE WEST'S MOST COMPLETE HOBBY SHOP

Complete stock of all leading makes of kits and motors.

All orders sent postpaid.

Highest trade in allowances on all motors.

Same Day Service.

QUINCY CYCLE SUPPLY

QUINCY MODEL SUPPLY

1205 Bdwy. St., Quincy, Illinois

GARY, INDIANA

INDIANA'S LARGEST INDEPENDENT HOBBY DISTRIBUTOR

Complete stock of Airplanes—Motors—Motor Parts—HO and O Railroads—Boats—Race Cars—Archery—Kits—Supplies—Accessories.

Home of "Rite-Pitch"—World's Finest Gas Model Propellers.

— Bob Roberts —

ALL-AMERICAN AIRCRAFT & HOBBIES

Phone 2-1355

110 West 7th Ave. Gary, Indiana.

NEW ORLEANS, LOUISIANA

SOUTHERN DEALERS!

Secure Your Requirements of Hobbycraft Kits, Engines, Supplies, Etc., from Our Complete Stock. Quick Service—Freight Savings.

EVENTUALLY!—WHY NOT NOW?

Megow's Exclusive Southern Distributors

MOD-KRAFF COMPANY

4506-08 Freret St., Dept. A,

New Orleans, La.

Write on Letterhead for Catalog and Discounts

QUINCY, MASSACHUSETTS

NEW ENGLAND'S FINEST MODEL SUPPLY HOUSE

Airplanes—Boats—Trains—Race Cars

Miniature Gasoline Motors

STANLEY—WINTHROP'S

Boston	Quincy
38 Chauncy St.	7 Revere Rd.
Hubbard 3668	Granite 0253

ST. LOUIS, MISSOURI

HOBBY-CRAFT

Compton At Shenandoah, St. Louis, Mo.

Read the Ads in Model Airplane News Then

Write—Wire—Call Your Order. We Got It.

3 Hour Mail Order Service.

Send In Your Old Motor For Estimate

IRVINGTON, NEW JERSEY

9 A.M. to 9 P.M. Sundays till 1 P.M.

Es. 2-6211

THE *HOBBY* SHOP

WE BUY, SELL AND EXCHANGE ANYTHING IN THE HOBBY LINE

All Types of Kits and Motors in Stock.

Mail orders filled

758 Springfield Ave., Irvington, N.J.

ROCHESTER, NEW YORK

CRAFT SERVICE

"Complete Hobby Stocks"

C-D, Comet, Peerless, Berkeley, Capitol, Strombeck, Ideal, Megow American Junior . . . all major lines, complete.

Motors a specialty! All leading makes in stock! Courteous fast replies—24 hour shipments. Dealer trade solicited . . . if your dealer cannot supply write direct to our **"Hobbyland Shop."**

Dept. 120, 337 University Avenue, Rochester, N.Y.

DAYTON, OHIO

Folks travel miles to deal at

GOOD'S HOBBY SHOP

1729 N. Main Street, Dayton, Ohio

Open Evenings and Sunday	Telephone T.A. 5578

87 different lines of model airplanes—race cars—boats—trains—beadwork—leathercraft—archery—tackle.

The pioneer hobby shop. Established 1928

SHILLINGTON, PENNSYLVANIA

Attention—

MODEL BUILDERS

We stock for your convenience leading lines of MODEL AIRPLANES, BOATS, RACECARS, RAILROADS, ACCESSORIES, MOTORS, PARTS, etc.

Also STAMPS for COLLECTORS.

Wholesale—Retail

Open evenings & Sundays. Mail Orders Filled.

IDLE HOUR HOBBY SHOP

423 Brobst St. Shillington, Pa.

SEATTLE, WASHINGTON

HOBBY CRAFT—H T WEEKS

THE BON MARCHE DEPT. STORE

SEATTLE, WASH.

We feature Model Gas Engines and parts—Ohlsson 60 Custom and Special, Ohlsson 23 and 19, Brown B and D, Forster 29, Elf Single and Twin, Atom, Cannon, Tiger Aero, KO 29, Hornet, OK Speedway and others. All makes of gas powered airplane kits in stock—Also rubber and solid models.

Full Line of Model Railroad—Autos—Ship Models

Mail Orders Filled Same Day Received

TORONTO, ONT., CANADA

ONTARIO MODEL AIRCRAFT COMPANY

Canada's largest manufacturers of Model Kits. Pioneers since 1928. Originators of the famous Model Craft line.

We specialize on British, Canadian and Popular American Models.

Send 5c for our twenty-four page illustrated price list of Kits and Accessories.

813A-817 Gerrard Street East, Toronto, Ontario, Canada

TORONTO, ONT., CANADA

Visit Canada's Most Complete Hobby Stores. Railroads. O-HO-OO-Tinplate. AIRPLANES—BOATS—RACING CARS—MOTORS.

COMET — IDEAL — BERKELEY — CLEVELAND — EASYBUILT and other popular makes.

Open Evenings. Wholesale and Retail. Complete Catalog 10 cents.

LLOYDS HOBBYCRAFT

1358 Danforth Ave. 635 St. Clair Ave. W.

WINNIPEG, CANADA

ST. JOHN MODEL SHOP

THE WEST'S LEADING HOBBY SHOP

Distributors of COMET, MEGOW, BERKELEY

Scientific and Easybuilt kits.

Large stock of GAS ENGINES and accessories on hand.

Send stamp for list.

644 Portage Ave., Dept. A, Winnipeg, Man.

of The National Exchange Club, were instrumental in securing the 134-acre tract for the modelers. Located only seven miles from downtown Toledo, the model port is one of the few in the country. This last summer, it was the site of an intra-club contest won by Garry Gordon of the Manglers, who was presented at the wiener roast with a model gas motor.

"Most of the 75 club members have flown their rubber and gas craft at the airport each Sunday with hundreds of spectators in regular attendance. The airport has good thermals and, except for a few trees, offers ideal flying conditions.

"This winter the group is following a course of aviation. It meets regularly at Central Y. M. C. A., where the 'Y' officers have provided a large meeting room.

"Members of the Manglers range in ages from 12 to 48. New officers for the year are: Ray Humphreys, Sr., president; Clinton Stanton, first vice-president; George Hentges, second vice-president; Lloyd Traub, secretary; and Wilbur Kachenmeister, treasurer."

New York

Here is something that should interest model builders extremely. They are very familiar with present day types of models but rarely do they see plane models of the early pioneers. During the early days of aviation Garden City, N.Y., was a center of activity, so now this community has taken upon itself to establish an exhibit dealing with the early days of flying.

Beginning on February 21st and lasting for approximately five weeks, the Long Island Children's Museum at Adelphi College in Garden City will exhibit a detailed study of the History of Aviation on Long Island. Aviation as it is remembered by the Early Birds as well as later developments of the industry, up to present day production will be presented in the form of models, dioramas and pictures. The exhibit will fill practically the entire area of the Museum in the lower floor of the Science building at the college.

In conjunction with the exhibit will be a section devoted to model planes, both of the early and present day types. A feature of the exhibit will be a model plane contest. Prizes will be awarded for the three models which in the opinion of judges, are outstanding in detail, authenticity to scale, and finish. Models of any planes, present or past, are eligible, provided they are either built-up or solid non-flying models of less than two-foot wingspread. Flying models will not be allowed to compete. Entry ies limited to boys and girls of Nassau and Suffolk counties, who are under 17 years of age. Contestants must have their models in the Museum by March 14th and leave them on exhibition in show cases that will be provided for that purpose until the judging of the contest on Saturday, either March 28th or April 4th. The definite date of the judging, which will be the date the exhibit closes, will be announced later.

On Saturday mornings, while the exhibit is open, motion pictures will be shown in the projection room of the building.

The exhibit will be presented under the direction of Miss A. Elizabeth Browning, curator of the Museum, with the technical assistance of Edward H. Yulke, of the Academy of Model Aeronautics.

Greatest
POWER to WEIGHT RATIO EVER DEVELOPED
OUTCLIMB - OUTPULL
OUTFLY
Any Engine
UP TO
Twice its
DISPLACEMENT
Super
ATOM
WEIGHS BUT 2 ozs.
11,200 RPM plus
With full power unleashed, Super ATOM develops a thundering 11,200 rpm (with 8" prop), climbs to an astounding 17,000 rpm with flywheel.
INCREASED FIN AREA
FOR LONGER, COOLER RUNNING
Tremendously increased fin area, including multi-finned, aluminum head, assures sustained, unfaltering power to last drop of fuel. Everlasting steel cylinder, with CircATOMic exhaust ports (exclusive) for lightning fast ejection of burnt gases. Fully lapped piston provides higher compression, longer life. Perpetually self-adjusting timer functions perfectly at all speeds—no wasteful power drag. Unique design hubshaft cushions difficult landings, reduces bent and broken crankshafts with enormous economies!
NEW STREAMLINED TANK
Streamlined tank of transparent plastic with "snap-on" prevents gas leakage. Automatic SWIVELTOP (springless) leakproof refueler for instantaneous refueling without removing tank.
READY TO RUN, COMPLETE WITH COIL, CONDENSER & SPARKPLUG $15.50
MICRODYNE ENGINES
Box 245 (M3) Gen'l Post Office, New York, N. Y.
If no dealer near you Send $5 for C.O.D. Service
FACTORY ORDER BLANK
MICRODYNE ENGINES,
Box 245 (M3), Gen'l P. O., N. Y.
Please send 1942 Super ATOM to:
NAME
ADDRESS
CITY, STATE
Payment enclosed (Cash or money-order) (Send cash by registered mail) $5 Deposit, balance upon arrival.

Model Airports

Mr. Arthur Hasselbach of Jackson's, 3079 Third Avenue, New York City, has set an example which well might be followed by other communities throughout the country. It deals with the old but vital question of model airports. In different communities various problems face those who wish to establish one of these centers of aeronautical interest. Perhaps Mr. Hasselbach's problem may be yours—and he is tackling the matter in a way which may bring results.

He has approached Borough President Lyons concerning the establishing of a model airport in the Throgg's Neck section of the Bronx. Mr. Lyons explained that to get satisfactory results it would be necessary to contact various organizations interested in model airplanes and then form a council of the various clubs which would send representatives to a designated meeting place, there to voice the opinions and suggestions of the various clubs concerning the establishment of the modelport.

In this way it would be possible to collect and present, in printed form, the ideas of all those truly interested in promoting model aeronautics in the community. Then in order to bring pressure upon the city administrative authorities, each member of the council from the various clubs should have all club members sign the petition to be presented to the officials. This petition

Mechanic

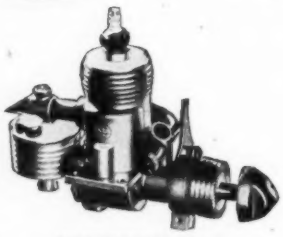
IN THE MAKING...

WITH THE HELP OF ROGERS MOTORS!

★ U. S. Air Chiefs will tell you that the first step toward sky supremacy is men who are masters of planes. And they'll tell you that the first step toward acquiring such men is basic training with models.

How well Rogers Motors fit this great wartime need! For Rogers are built with the same precision that's found in our military giants. In working with them, *you learn precision*—the beginning of all aeronautical success! And Rogers teach the principles of carburetion, heat conductivity, timing, ignition, many essentials of aircraft power!

Truly, the boy or young man with a Rogers is a mechanic in the making . . . preparing to serve his country. Produced in America's *largest* miniature motor plant, Rogers combine light weight and long life with terrific power, speed and quick, sure-fire starting!



THE ROGERS 35
Lightest weight Class C in the field! Unequaled in like displacement! Weighs only 4¾ ounces. Displacement of .35. Bore: .888. Stroke ¾". A power-plant of speed and stamina! Completely factory-built. Block-tested. With coil and condenser. **$12.95**

Other Famous Rogers Motors

Rogers KD-29	Class B	$ 4.95
Roger RMC-2	Class B	7.95
Rogers Air Youth KD-29	Class B	6.95
Rogers 29	Class B	12.00

Rogers MOTOR CO.
START 'EM FLYING WITH A ROGERS!

PHILADELPHIA • PENNSYLVANIA
Canadian Distribution:
Ontario Aircraft Co., 56 Esplanade Toronto, Canada

should state exactly what is desired and benefits to be derived, bringing in especially the value of model aviation in the design and construction of large scale aircraft.

Mr. Hasselbach wishes to form a council of leaders from the various clubs in the New York area, so he takes this opportunity to request that all interested in a New York model airport contact him at his above address. This is important and all leaders should contact him immediately.

A council then will be formed to create a petition, this to be presented to the city officials.

Many builders in the N.Y. area will realize what a great step forward a municipal model airport will be; in the past it has been necessary to travel many miles to fly their ships. Those flying at Van Cortlandt Park have been surreptitiously "kicked off," holding in their hand a little white ticket to appear in court. All of this we believe is extremely unjust but is only indicative of the lack of intelligent consideration given to this matter by city officials. Lack of cooperation on their part can only be the result of their ignorance concerning the value of model aeronautics in educational and defense programs.

We suggest that model builders throughout the city take the foregoing method of approaching municipal authorities. Unless the petition has at least 1000 names officials are not inclined to consider it seriously.

Another approach to the problem is to write the A.M.A. for suggestions, addressing your communications to Mr. Ed. Yulke, chairman of the Model Airports Committee, A.M.A., Willard Hotel, Washington, D. C. This committee is taking action immediately concerning the airport problem and is out to get results. Unquestionably they will be glad to offer suggestions to all those who write to them.

VICTORY

SEE M&M'S New 2⅝" Flyweight Gas Wheels ½ oz. PER PAIR PAIR PP. 85c
3" Balloon Wheels $1.10 PAIR PP.

Ask your dealer for our new free colored literature

Get That Extra Protection With M&M

All M & M Wheels can be inflated & deflated

Beware of Inferior Wheels built to look like M&M's

All sizes of M & M Wheels are the Lightest and Best Wheels Made

M & M Super Heavy Duty Wheel for Rubber Powered Models.
SIZES 1¼—1⅜—1½—1⅝"—PRICE $0.60 Per Pair, Postpaid.
SIZES 1⅞—2—2⅛—2¼—2⅜—2½—2⅝"—and Special Designed DoNut Wheels.
Size 1¾"—PRICE $0.70 PER PAIR, POSTPAID. For Air Mail Add 11c.

M & M'S ARE STANDARD EQUIPMENT IN ALL LEADING KITS
M & M's New 2⅝" WHEEL Designed for SMALL GAS MODELS ONLY $1.00. For Air Mail add 17c.
M & M 3¼" Gas Wheels $1.60 P.P. For Air Mail Add 21c.
3½" & 4½" Gas Wheels—Now only $3.00 per pair, postpaid.
6" Gas Wheels for Radio-controlled models $1.75 Per Pair.

DEALERS—Our new discounts are very attractive. BUILDERS—Send for free colored illustrated literature.

M & M MODEL WHEEL CO. 325 North 78th Street SEATTLE, WASHINGTON, U. S. A.

Obtain M & M Products from any Progressive Dealer or Send to Us

Flash News

(Continued from page 2)

would enter training immediately if some form of government subsidy were made available. Such a plan, which would loan these anxious youths money for training to be paid back out of their salaries after entering the industry, would answer a heartfelt want of these 15,000 young men and a 100,000 more just like them.

Present indications would mean a seven-day 50-hour work week for aviation industry employees for the duration but such a move would bring down a storm of opposition from labor leaders who, in the majority, have worked sincerely for the gains labor has made in America in the past ten years. Such a plan would mean, simply, regular time for 50 hours and over-time for hours in excess of that, normally, 56. Both A. F. of L. and C.I.O. leaders maintain that at least for the time being a 40-hour week for the individual and a 24-hour-a-day week for the factories through use of three shifts would provide adequate aircraft production.

A German Heinkel bomber was shot down over London recently and was found to be equipped with a barrage balloon cable knife. The contraption consisted of a large metal blade running from the wing tips inboard to a point about five feet forward of the nose. The blade was heavily braced and gave the ship an appearance of an arrow in flight.

Lockheed has merged Vega Airplane Company, its subsidiary, into the parent company in an effort to complete closer cooperation between the two firms. Vega has begun production on the first of its Boeing B-17E Flying Fortress bombers. It is well under production of the Vega Ventura bomber, a larger, faster and heavier version of the Lockheed Hudson which has done so much damage to enemy ships, docks and planes in the hands of British R.A.F. pilots and crews. More than 1500 Hudsons have been completed!

The Distinguished Service Cross has been awarded by the War Department to Lieut. George S. Welch, who shot down four Japanese planes, and to Lieut. Kenneth M. Taylor, who bagged two on that fateful Sunday morning.

Dr. Sanford A. Moss, engineer with the General Electric Company, received the 1940 Collier Aviation Trophy for the greatest aeronautical achievement during that year. He developed and perfected the turbo-supercharger which he invented many years ago. Sharing the trophy were Major-General Walter R. Weaver, acting Chief of the Air Corps (in the absence of General Brett, mentioned above) and Brig. Gen. Oliver P. Echols for the National Aeronautic Association. After inventing an exhaust driven turbo-supercharger in 1917, Dr. Moss, now 69 years of age, continued his experiments on the mechanism until he announced its perfection in 1940. It is used on the Lockheed P-38, Bell P-39

A Sensation Everywhere!

JOE OTT DESIGN TOPS THEM ALL!

36" Wing Span.....75c

BUILD YOUR NEXT FLYING MODEL FROM AN *Ott-O-Former* KIT

Saves Over One Half of Building And Assembly Time. Makes Better, Sturdier Ships

Only Joe Ott designed kits give you the new and better Ott-O-Former method of building model airplanes. Don't be satisfied with anything less than this new labor saving method protected by U.S. patents. All of the hard work is done in Ott-O-Former kits. Get Joe Ott designed kits from your dealer and build better and stronger flying models. Have more fun flying your models—an easier and more pleasant job making them. Many new models are ready for you now.

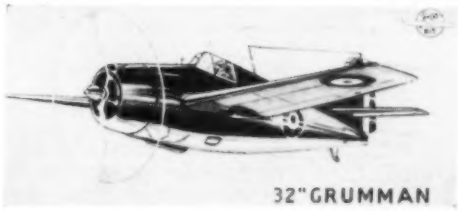
NOTE THESE TEN EASY STEPS OF CONSTRUCTION

1. Remove Ott-O-Formers from sheet.
2. Make two body sides of 1/16" material and assemble into foundation frame.
3. Place Ott-O-Formers over foundation frame and cut notches for stringers.
4. Cement stringers into prepared notches in Ott-O-Formers.
5. Cover body, using tissue in as large pieces as possible.
6. Remove elevator Ott-O-Former from sheet, add spars and ribs and cover with tissue.
7. Remove rudder Ott-O-Former from sheet, cement spar and ribs in place and cover.
8. Remove wing tip Ott-O-Formers from sheet.
9. Place on plans, add lower section of ribs, spar, leading and trailing edges.
10. Add curved rib sections, cement and cover.

* * *

All Ott-O-Former kits, regardless of size of model follow this same time and labor saving method of construction.

NEW BATTLE PLANE FLYING MODEL KITS—15¢-50¢-75¢



22 Inch Wing Span, Complete Kits.....15c

Spitfire Pursuit
Vought Sikorsky
Curtiss Pursuit
Hawker Hurricane
Stuka Dive Bomber
Airabonita
Messerschmitt

32 Inch Wing Span, Complete Kits.....50c

Vought Sikorsky
Grumman
Stuka Dive Bomber

Three more brand new models now in preparation. Watch for announcement.

36 Inch Wing Span, Deluxe Kits.....75c

(As illustrated at top of page)

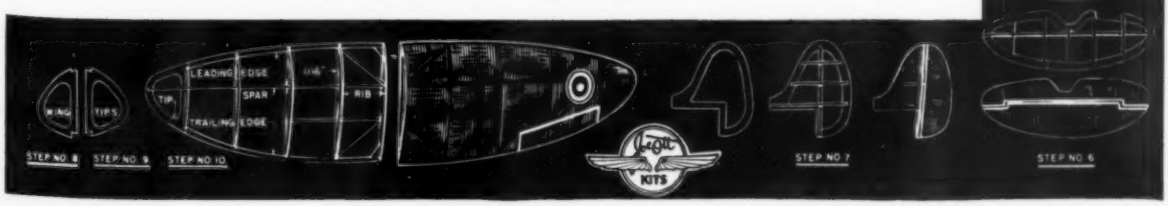
Vought Sikorsky
Lockheed Interceptor
Curtiss Pursuit
Airacobra Fighter

These are complete Ott-O-Former Kits containing all necessary materials and parts, including cement, cut formers that eliminate all tiresome work, balsa, tissue, wheels, propeller and other parts and full-size, three view Joe Ott plans.

See your dealer first. Minimum mail order $1.00. Postage and packing 25 cents extra. New 1942 catalog and 32 inch plan 5 cents. Dealers write. Some jobber territory still open.

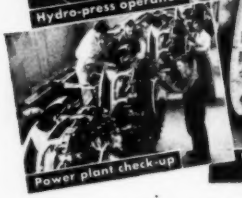
JOE OTT MANUFACTURING COMPANY

226 WEST SCHILLER STREET, CHICAGO



Aviation Executives Say . . .

We Can't Get Enough Men for the *More Important* Production Jobs



Here's the REAL opportunity in aircraft manufacturing . . . an opportunity that means bigger pay at the start, faster advancement, the security of a lifetime career. It's not in the routine manual labor and machine operating jobs. It's in the more skilled, more technical duties—such as inspection, power plant installation, final assembly, experimental work, and other specialized duties that only a comparatively few men have had the foresight to qualify for.

Among such men are the over 3200 Aero ITI graduates now holding responsible jobs with over 130 leading aviation firms. Aero ITI trained men are IN DEMAND . . . are marked men in Aviation. Follow in their footsteps and take the fullest advantage of the matchless opportunities for big earning power, personal achievement, and outstanding success held out to you by the even greater aircraft industry of the future. Aviation leaders say the industry will have plenty of room for you THEN . . . if you start out where there's the most room NOW.

Find out how Aero ITI training gives you the kind of a start it takes to STAY in Aviation. Write and tell us what you want to do and be in Aviation . . . or just fill in the coupon and send it in NOW.

AERO INDUSTRIES TECHNICAL INSTITUTE
5264 WEST SAN FERNANDO ROAD, LOS ANGELES, CALIFORNIA

Five Courses in AIRCRAFT MECHANICS and AERONAUTICAL ENGINEERING
—Including 12 Month Aircraft Mechanics Course
Approved by U. S. Civil Aeronautics Administration

AERO INDUSTRIES TECHNICAL INSTITUTE, 5264 W. San Fernando Road, Los Angeles, Calif.
Please send me complete information on Aero ITI training for a career in aircraft production.
Years High School: ☐ 1, ☐ 2, ☐ 3, ☐ 4. Years College (Liberal Arts): ☐ 1, ☐ 2, ☐ 3, ☐ 4.
Years Engineering College: ☐ 1, ☐ 2, ☐ 3, ☐ 4.

Name_____ Age _____

Address_____

City_____ State_____ P-2-MA

Executive Management Board

ROBERT E. GROSS
President, Lockheed Aircraft Corporation

JOHN K. NORTHROP
President, Northrop Aircraft, Inc.

C. A. VAN DUSEN
Vice-President, Consolidated Aircraft Corporation

and the new North American Mustang.

Major-General Herbert A. Dargue, commander of the First Air Force centered at Mitchell Field, New York and seven other officers and men have been reported missing since December 19th last on a bomber flight from Phoenix, Arizona, to Hamilton Field near San Francisco. Also aboard the craft, believed to have crashed into the wooded hills near Palmdale, Calif., scene of many similar disappearances, were Colonels Charles W. Bundy and George W. Ricker.

The first North American B-25 light attack bomber rolled off the new assembly line of the firm's huge Kansas City plant recently; hundreds more were promised by enthusiastic workmen. It required only nine months from ground-breaking exercises to completion of the giant factory and the flight of its first product.

Last September FLASH NEWS reported release of 100 Army Air Corps pilots for duty in China. The War Department permitted the men to resign their commissions temporarily and received new commissions in the Chinese Airforce. More important, with them went an equal number of Curtiss Tomahawk pursuit planes, export version of the popular and deadly P-40 type. Comes now the news that, at this writing, the group have shot down 26 Japanese airplanes all told and have, on duty with the Netherlands East Indies Airforce, succeeded in sinking and damaging several Japanese troop transports and destroyers. Known as the "American Volunteer Squadron" the group has been shifted almost daily and were last reported in Rangoon protecting the vital Burma Road.

A "truth is stranger than fiction" tale comes from Honolulu involving the recent rescue of nine Army aviators by the crew of a Navy patrol plane. The Army airmen had been adrift in two small life rafts for four days, weathering two severe storms which swept away their emergency provisions, when the giant Navy PBY flyingboat sighted them. The ship landed alongside and took them aboard while heavy seas tossed the giant plane about like a chip. Ensign P. M. Fisler, in command, and Aviation Machinist Mate Leonard Wagoner were decorated with the Navy Cross by new Cincus Admiral Nimitz who stated: "The action was nothing less than heroic!"

VICTORY

Academy of Model Aeronautics

(Continued from page 30)

The Academy would endeavor to provide list of clubs which are active in a particular district; and try to have such clubs hold meetings and contests so that the service men could attend them.

It is further hoped that the various magazines and manufacturers cooperate by granting substantial discount to the members of the M.A.U.S.A.

The members need not be members of the Academy. Also, this organization would not be part of any other service organization. The basic thought would be to have each camp provide its own activity. If by chance inter-camp contests result, so much the better. "Of, by, and for" model builders in full sense of the word.

Result: It has been found that if a person can pursue his hobby he will be happy no matter where he may be. Such a hobby also provides a common meeting ground, which is most essential in a strange place.

Insurance

Ever since the gas model insurance was put into effect there has been considerable misunderstanding as to its coverage and the method of action in cases of accidents. The insurance was originally arranged for by the National Aeronautic Association in response to many requests for coverage. The insurance was set up, not to provide coverage for a modeler every time he broke a fingernail or stepped on the stabilizer of his model or dented the fender of the contest director's car, but primarily to provide protection for *liability imposed by law* for bodily injuries to members of the public and damage to property of members of the public. The insurance companies explain, in reference to the certificate of insurance which is granted to those who secure this coverage, that:

"This is not a policy which *voluntarily* will pay for any damage you do. It is a policy which will pay your *legal liability* as determined by law for any damage or injury done, and will pay the cost of defense of the claim. This is the same form of insurance carried by airplane owners throughout the country. This insurance does not cover damage done to one model by another during the course of a meet."

Actually the insurance coverage which is afforded under the terms of the policy held by N.A.A. is the same form purchased by the airlines to cover DC-3's or any transport, and by private flyers to cover their planes. This insurance does not pay for every claim irrespective of the legal liability. As is stated in the certificate and already mentioned, it covers only those claims resulting from court action. In other words, if you go out and break the windshield of the neighbor's car with your gas model, unless court action ensues, and you are held liable, the insurance company pays nothing except the cost of defending any legal action that may be brought. Of course the insurance companies always have the option of settling claims out of court if they think they can do so more economically than by having the claims brought to trial. This option belongs only to the insurance company and N.A.A. cannot influence their judgment as to out-of-court settlements. The only function of N.A.A. is to act as a collective buying agent for members in order to procure insurance at $1.00 per member that would cost many times that amount if purchased individually. Incidentally, N.A.A. makes no commission or profit in any way on the insurance and has to bear the burden of the clerical service which arises in conjunction with issuing the insurance certificates.

The foregoing is publicized to correct the mistaken idea that some gas modelers seem to have that anything they do or

any damage they inflict with a gas model will automatically be paid as long as they hold insurance. This is erroneous.

Obviously if all claims were to be paid without reference to legal liability the insurance would have to cost a great deal more than $1.00 per member, as it is a frequent occurrence that models damage automobiles, windows of neighboring houses, or other property, and in some cases inflict severe injury on spectators or bystanders. Reserves posted by the insurance company to cover pending claims already total considerably in excess of the total premiums paid in. While it is anticipated that not all of these claims will be settled in full, it is probable that the insurance company will make no substantial profit on this business.

Whether you are insured or not, bear in mind that the mere fact that your model hits an automobile is not the presumption of your fault in the accident. It might be quite possible that the automobile owner legally is as much at fault as you are, if not more so, and the mere occurrence of such an accident is not necessarily a reason for payment, either by you or by the insurance mompany.

It should also be remembered that, if the modeler is involved in an accident he must not admit liability or say, "I'm insured—my insurance company will pay." Such a statement voids the insurance. The modeler should say, "I am insured and I will report this to my insurance company," and nothing more.

Model airplane clubs should seek information from local legal advisers so they will be better informed on this score. It is pointed out that as long as the modeler does not negligently fly his plane at a person or property or violate N.A.A. regulations, he probably is not inflicting willful damage for which he may be held legally liable.

* *

The Academy wishes to record information concerning the value of model airplane training, whether or not it has been helpful in making your job more enjoyable and your life more successful. Will you please cooperate and fill in the following form, sending it to the address indicated beneath?

Name ..... Age .....

City ..... State .....

Years of model building experience?.....

Are you now an active model builder?.....

Present occupation?.....

By whom employed?.....

Nature of duties?.....

How has your model airplane building experience helped you get and hold your present job?.....

.....

.....

Mail to Academy of Model Aeronautics, Willard Hotel, Washington, D. C.

NOTE: You may copy the form to avoid cutting your copy of MODEL AIRPLANE NEWS.

VICTORY

The MOST for Your Money in PERFORMANCE and POWER

SKY CHIEF

only $7.95

BLOCK-TESTED
UNCONDITIONALLY GUARANTEED

Making Immediate Shipments

Class "C" 1/5 H.P.—Complete with Coil & Condenser

* Sky Chief "Lightning" 3 ounce Coil
* Bore 7/8", stroke 7/8", displacement .526
* R. P. M. up to 13,000 with 13" propeller.
* All bearings are Diamond-bored and Micro-lapped
* Weighs approximately 10 ounces with coil and condenser
* Multiple-finned Cylinder made of Molybdenum Iron
* Piston centerless-ground and Micro-lapped with PERFECT CIRCLE Piston Ring for longer motor life
* Heat-treated Crankshaft made of polished-ground steel scientifically balanced.

Not a kit—a completely assembled motor ready to run.

SEND FOR COMPLETE DESCRIPTIVE LITERATURE TODAY. USE HANDY BLANK OPPOSITE.

AMERICAN SUPERCRAFT CORPORATION
711 W. Lake Street, Dept. M
Chicago, Ill.
Name .....
Street .....
City ..... State .....

Plane vs. Battleship

(Continued from page 5)

most modern battleships have a top speed of 21 knots (24 m.p.h.) their normal cruising speed is only 13 knots (15 m.p.h.) which, compared to the modern bomber's cruising speed of 250 m.p.h., might be considered no speed at all. This slow speed is also a function of maneuverability together with its huge displacement and great length. A modern battleship costs approximately fifty million dollars and takes more than two years to build and commission. In this time and for this money one thousand bombers might be built.

This being true and, since war is only economics in a little different form, wouldn't it be cheapest to build a fleet of airplanes with the same destructive power of a fleet of battleships.

Let us assume, correctly, that we now have a fleet of 15 battleships mounting a total of 150 guns of 14 and 16-inch bore. A single naval gun can be cleared, loaded and fired in an average of 20 seconds, some accomplish this in just 9-1/2 seconds! Therefore, these 150 guns can be fired three times a minute or a total of 450 projectiles every minute. We will also assume a battleship projectile and a modern 2,000-lb. airplane bomb are of equal destructive power (although this gives undue advantage to the bomb as will be brought out shortly). To equal the gunfire of the battleship fleet for a single minute would require 450 airplanes (since modern naval bombers cannot carry more than one of these giant missiles). Assuming there are an equal number (15) of enemy battleships we could assign 30 bombers to each of these. In order to drop their load in one minute would require the bombers to pass over their respective target at an interval of one every two seconds (an impractical feat in itself). After each bomber had released its bomb it would be forced to return to its aircraft carrier while the battleships con-

"A burd ALWAYS FLIES"

Chester Lanzo's RECORD HOLDER
A PROVEN CHAMPION

in the World's Toughest Competition. Not just a drawing board dodo but a genuine super-dooper Contest flyer with performance **proven the best in actual competition!** BURD gives you a kit of the finest quality with truly selected Stress-Tested balsa and all parts complete. Get the genuine BURD kit at your dealer's.

55" WINGSPAN

LANZO'S RECORD HOLDER
NATIONAL STICK WINNER

$1.00

burd model airplane co.
2115 East Oliver St. Baltimore Md

Tow-Line SOARING GLIDER

Soar up, up into those high rising thermals with this BURD cloud chaser. A giant wingspan soaring glider with plus performance that all BURD flyers have. It's a terrific value easily worth three times this special price. Ask your dealer for the BURD Soaring Glider. It's the best!

50" WINGSPAN

with
STRESS-TESTED
BALSA WOOD

Mr. Jobber: There are still territories open and real sales possibilities with the BURD line. Write today.

AT DEALERS EVERYWHERE 39c

by mail 20c extra

tinued to rain 450 shells a minute on the enemy fleet.

To carry these 450 bombers would require about nine aircraft carriers the size of the huge "U.S.S. Lexington" or "U.S.S. Saratoga" (which can carry only 50 heavy naval bombers, their normal complement of 85 airplanes including two squadrons of small fighters and a squadron of equally small scout-observation machines in addition to the single bomber squadron. To equal gunfire of the battleship fleet for two minutes would require *eighteen* carriers. And the cost of the carrier fleet necessary to equal fire-power of the battleship fleet for four or five minutes would greatly surpass the battleships' cost, completely excluding the cost of airplanes, fuel, etc., necessary for the undertaking.

On the other hand, let's compare the cost to annihilate the sea or the air fleet. Assuming 100% hitting accuracy, it would take 15 torpedoes, costing $10,000 each, to sink the battleship fleet, or a total of $150,000. Five-inch anti-aircraft shells cost $50 each and this sum of money would destroy only 3,000 airplanes costing $150,000,000 whereas the battleship fleet lost would represent $750,000,000 or just *five* times greater. For the same money, then, the enemy can destroy far less airplanes than it can battleships!

Another argument advanced frequently is whether a fleet of airplanes contains greater destructive power than a battleship fleet. Prime factor in bomb or shell design is "hitting power" or kinetic energy which drives the missile into the target prior to explosion. A bomb or shell lying on the ground and touched off by electricity does little damage and destructiveness is a function of penetration. The formula for kinetic energy reads: K.E. = $\frac{mv^2}{2}$ or more simply: $1/2mv^2$ in which "m" represents mass or weight of the falling body and "v" its velocity or speed. From this it is evident that doubling the mass only doubles kinetic energy, whereas doubling velocity quadruples it.

A falling bomb never reaches the amazing speed popularly attributed to it since gravity acts very slowly and air resistance very quickly. Each size and type of bomb has a certain speed at which the force of gravity and air resistance exactly equal each other, known as "terminal velocity," faster than which the bomb cannot fall. (For example: A 550-lb. bomb has a t.v. of 918 f.p.s.; a 1100-lb. bomb has a t.v. of 940 f.p.s.)

A bomb rarely, if ever, reaches its terminal velocity. A 550-lb. bomb dropped from 20,000 feet (normal maximum for accuracy) will have a velocity of only 880 f.p.s. when it hits the ground, far less than the 918 f.p.s. t.v. given above. From the above formula bombs dropped from this

$5 CONVERTS yours into a 1942 Super ATOM!

Plus return of old units being replaced (see list)

$6.50 Value if purchased separately

Factory Special!

COMPLETE NEW STREAMLINED CYLINDER UNIT!

This replacement unit INCLUDES
*Multi-Finned Cylinder Head
*Streamlined Steel Cylinder
*Fully Lapped Piston
*Sub-Piston
*Connecting Rod
*Retaining Ring

A bonus to early ATOM owners! Replace with this new, complete unit and you will be adding hours and hours of new, thrilling flight performance! Makes yours a 1942 Model Super ATOM, regardless of age or condition—a $15.50 motor for a $5.00 investment.

New STREAMLINED TANK
Transparent plastic with automatic SWIPELTOP So-ingless Refueler (leakproof) for instantaneous refueling without removing tank.
$1

Notice to DEALERS

This replacement special prevails ONLY if all the old units (as listed above) are returned when ordering, otherwise replacement charge will be made.

MICRODYNE ENGINES
PARTS REPLACEMENT DIVISION
Dept. MA-3, Box 245, Gen. Post Office N. Y. C.

height have a kinetic energy of 6,800,000 foot-pounds as it strikes. Chief airplane type used against the battleship, however, is the so-called "dive-bomber" which releases its weapon at 2,000 feet and pulls out of the dive hastily as the bomb continues towards its target. Largest dive-bomber bomb now used is the 550-lb. type. The airplane-bomb combination will have a velocity of 200-250 m.p.h. (dive-bombing release regulation speed in U.S. Navy attained through use of "dive-breaks" slowing the bomber to this speed) at the point of release at 2,000 ft. At this point the bomb is traveling 293.4 f.p.s. and will pick up 151.6 f.p.s. before it strikes, giving a striking velocity of 445 f.p.s. It will have a kinetic energy of only 1,700,000 foot-pounds, just *one-fourth* that of the bomb dropped from 20,000 ft. given above. This will undoubtedly come as a surprise to most dive-bomber enthusiasts that high altitude horizontal bombing is vastly more destructive than low-altitude dive-bombing.

Now let's turn to the 16-in. naval gun which fires a projectile weighing 2100-2500 lb. a distance of 40,000-45,000 yards (22.75 to 25.5 mi.). Muzzle velocity of these guns is 3000-3300 f.p.s. and striking velocity is 2000-2200 f.p.s. The kinetic energy of this shell upon striking the target will be approximately 189,000,000 foot-pounds or 111 times that of the dive-bomber bomb. Theoretically it would take 111 bombers to equal the destruction of a single naval shell or a total of 49,950 bombers to equal the 450 guns of the 15-ship battleship fleet firing a single salvo!

A modern battleship carries approximately 2,000 rounds of 16-in. shells weighing 2500 lb. or a total of five million pounds of destructive. To equal this power would require a fleet of 2500 airplanes carrying 2,000 lb. bombs for each ship or a total of 37,500 bombers to simply carry the load of shell stored within the fleet of 15 battleships. Multiply this by the 111 bombers needed to equal a single naval shell and you find that to equal the total fire-power of our battleship fleet would require a total of 4,162,500 bombers carrying 2,000-lb. bombs or a total of 14,985,000 dive-bombers carrying 550-lb. bombs!

The battleship fleet, standing in one spot and raining destruction on a specified target, cannot be compared with the airplane fleet in sheer weight and power of metal thrown. But how important is this single quality in attempting the destruction of an enemy nation as compared with the military airplane? After all, a battleship can never attack an airplane while the plane can always choose the time and place of its attack.

Let us assume the United States had rightfully ignored the vitriolic opposition of pacifists and had fortified the island of Guam three years ago instead of permitting the move to be shouted down in Congress. Let's also assume the Japanese Fleet had been sighted out at sea on the morning of December 7th last. The interception is to take place north of Luzon in the Philippines at a distance of 2,000 miles from the supposedly fortified Guam naval and air bases. At news of the discovery, the U.S. Fleet and squadrons of Navy patrol-bombers had been dispatched simultaneously. At a normal cruising rate of 15 m.p.h. it would take the main body of the Pacific Fleet a total of 134 hours or more than 5 days to reach the vicinity. The Consolidated PBY's, with a cruising range of 4,000 miles at 180 m.p.h., would reach the enemy fleet in just 11 hours. A round trip could be made in 24 hours or a total of 5 separate raids on the fleet while the Pacific Fleet was still steaming to the attack. This ship has a disposable load of 13,840 pounds, sufficient to carry six 2,000-lb. bombs or torpedoes. Each ship could drop a total of 30 such missiles upon the enemy fleet. Since 500 PBY's can be built for the same cost as one battleship, we can assume that 7500 PBY's engage in the mission, an equal investment with that of the 15-battleship fleet. This would indicate while the Pacific Fleet was still steaming towards the enemy and making ready for action, the flying boats had already dropped a total of 225,000 bombs upon the Japanese Fleet, *seven times* as many as the 30,000 shells carried by the entire battleship fleet!

The bomber can be considered as a long-range platform for carrying the Navy's destructive power. Above we mentioned the modern naval shell has a range of approximately 25 miles as compared with the 2,000 mile round-trip range of the modern patrol-bomber. Thus, when astutely used in combination, our Navy's big guns can fire tons of destruction a distance of 2,000 miles in just 11 hours. The Navy's guns carry more hitting power and can speak in a much greater volume, but the Navy's patrol-bomber can get it there, where they want it and when they want it! And a few direct hits on a vital target can do a great deal more damage to the enemy than can tons of metal tossed at its battleships or shore stations.

For scouting purposes and the all-important role of gaining knowledge of the enemy's strength, dispersal, speed and bearing there is little comparison between the far but slow moving cruisers and the Navy observation-scout machines. From the deck of a cruiser the look-out can see for a distance of 5.7 miles in a given horizontal direction; from the fighting-top on the mainmast he can see 13.57 mi. in any horizontal direction. From a patrol plane at 15,000 ft., an observer can see 93 mi. in any direction and at 20,000 ft. can see nearly 120 mi.! The patrol plane would sight an enemy vessel 2,000 miles at sea in just 11 hours, radio the position and have attacking bombers on the way within an hour. The entire naval fleet would have to steam innocently to within 15 miles of the enemy fleet before even know-

TIGER AERO
TIGER AERO
TIGER AERO
TIGER
TIGER SERIES ENGINES
BUNCH
TIGER AERO MOTOR
$18.50
★ Model builders and dealers—you can depend on the Bunch Motor Company and Tiger Aero motors. No other engine can claim or prove records to equal the victorious achievements of TIGER AERO MOTORS.
BUNCH MOTOR COMPANY
6714 McKINLEY AVENUE
LOS ANGELES, CALIFORNIA
TIGER MOTORS ARE CLASS C

★QUALITY FIRST★QUALITY FIRST★QUALITY FIRST★

QUALITY FIRST★QUALITY FIRST★QUALITY FIRST

Get started right!

Many a young man's future career in aviation will have its beginning with his first successful powered airplane flight,—with a gas powered model airplane! Many a young man will turn away from aviation forever because of his first disappointments! With so much at stake, your future career, your country's needs, it is most important that you start right by choosing a good motor. The road to success is hard at best. Let a FORSTER motor help you to your first achievements in powered flight.

the FORSTER "29" for 1942

"B" class,
.297 in. displ.,
1/5 H.P. at 7200
r.p.m.
with 12 in. prop,

$18.75 Complete With Aero Coil and Metal Condenser

Outstanding for

Quality, Engineering, Speed & Power

For complete specifications write for folder "B"
If you want decals for your plane, "Powered by Forster," send a 3c stamp for two.

FORSTER BROTHERS

1415 Lake Street — Melrose Park, Illinois

★QUALITY FIRST★QUALITY FIRST★QUALITY FIRST★

ing of its existence without airplane scout planes!

The old, old question of: "Can Airplanes Sink Battleships?" is a question no longer. The "H.M.S. Repulse" and the "H.M.S. Prince of Wales" went down off Malaya on December 10th, 1941 after concentrated attacks by Japanese bombers. These two ships, the latter latest and most powerful of the British Royal Navy, were no match for the accuracy and destruction of the winged bombs. The "U.S.S. Arizona" was sunk in Pearl Harbor on that fateful Sunday morning, December 7th, 1941 by Japanese bombs, one of which is claimed to have passed directly down her funnel. The "U.S.S. Oklahoma" was turned turtle in that same attack by repeated airplane bomb hits, although she is being repaired in drydock and will join the Pacific Fleet shortly.

The deadly 550, 1100 and 2,000-lb. bombs of naval and army bombardment planes penetrate decks of out-moded battleships like so much paper, and development of new bomb sights and bombing techniques have made accuracy within the realm of 90% direct hits. And the 5,000 mile range of modern naval and army bombers, such as the PB2Y patrol plane, Boeing B-17 and Consolidated B-24 "Flying Fortress" type four-motored giants, make no vessel on the high seas *anywhere* immune from their attack.

This war has perfected a new type aircraft attack on battleships which, although under experiment for more than 15 years, has become a prime factor in air-naval warfare: the torpedo plane. The torpedo has changed little from World War I days, still has same dimensions and internal mechanisms, still is the same instrument which scored only one hit out of every 44 launched during that struggle. But the secret of a successful torpedo attack lies not with the destructiveness of the instrument but the skill and technique of its preparation, aiming and launching, and in this latter has come the revolution.

Both the Whitehead and Bliss-Leavitt type torpedoes are used by our Navy, the former being 14 inches in diameter, 15 feet long; the latter is 21 inches in diameter, 21 feet long. The Whitehead has reciprocating engines, the Bliss-Leavitt turbines driving twin screws. The B.L., having almost completely replaced the Whitehead, has a speed of 30 m.p.h., costs $10,000 to build and contains 5500 working parts. It is divided into six compartments as follows (from bow): the warhead containing 500 pounds of explosive, the air-flask tested to a pressure of 5,000 p.s.i. and operating at a pressure of 2,250 p.s.i., the depth control mechanism consisting of a pendulum and hydrostatic piston with which it can be set to run at any desired depth, the engines which consist of a pressure reducing valve, an alcohol-flame boiler producing steam that drives the turbines and finally the gyroscopic steering gear. The effective range of a torpedo is only a little more than a mile (2,000 yards) longer ranges being impractical due to necessity of additional air chambers, engines, etc., cutting down the warhead capacity. Torpedoes operate at different depths, depending upon the draft of the target, but normally at about 10 feet. Object is to strike just below the waterline but not too deep to permit cushioning effect of water muffling explosive-force. (Torpedoes do not plane along the surface as is popularly believed, although their wake is clearly visible from about 20 yds).

Torpedoes are not designed to penetrate into the battleship's side but rather to create a terrific explosion against the armor belt sufficient in intensity to spring the plates and permit entrance of seawater. Due to weight restrictions, battleship frames and bulkheads are spaced at intervals of not less than five feet (60 inches), thereby throwing the full force of a torpedo explosion directly on the armor-belt seams.

Although a torpedo, uninterrupted, may run for as long as eight miles before coming to rest, the maximum range, as stated above, is only one mile to insure sufficient speed, accuracy and detonation. Battle formation calls for battleships to be protected by destroyers running off either beam and continually changing bearing on the lookout for submarines by watching for periscope wake and listening to underwater receivers.

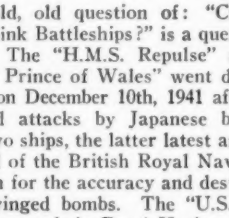
And within this one-mile space, graphically termed "hell's hip-pocket" the torpedo-plane does its deadly work, skimming down to within 10-15 feet of the water (greater height might injure the delicate mechanisms of the torpedo or break its shell in half), launching its weapon and zooming back up to safety. Speed and maneuverability gained by nervy and skillful piloting will enable the torpedo plane to rocket free safely.

In this work a new team has appeared: the airplane-submarine combination which, working in small groups, more often than less succeed in hitting a battleship one way or the other. The mode of attack calls for concerted effort with the torpedo-plane blasting the protecting convoy out of line and permitting the submarine to slip into the pocket. In the case of the unprotected naval vessel, the airplane will strike first (since it carries only one torpedo) and permit the submarine to step in and finish the work with three or four more deadly underwater shots in the crippled battleship's vitals.

As a defense against the airplane the modern battleship is equipped with anti-aircraft guns, deck armor and aerial support when available.

Our modern battleships carry twelve 5-inch 51-calibre secondary batteries, twelve 5-inch 25-calibre anti-aircraft bat-

AIRCRAFT SKETCHES 10¢ EACH



MORE THAN 60 AUTHENTIC DETAILED SKETCHES OF THE LATEST U. S. MILITARY U. S. COMMERCIAL AND FOREIGN AIRCRAFT, REPRODUCED ON HEAVY WHITE VELLUM PAPER. 9½x12½ INCHES.
Send 10c for Sample Sketch and Catalogue containing over 1500 Photographs. Sketches of the U. S. Fleet, Books, Jewelry, etc. Or send 3c for Catalogue only.

DEALERS: WRITE FOR DETAILS
CRAFT ART COMPANY DEPT. 2M
246 FIFTH AVE. NEW YORK, N. Y.

THE ENTIRE FLYING WORLD ACCLAIMS THIS GREAT BOOK!

"MODEL AIRPLANE DESIGN *and* THEORY *of* FLIGHT"

FOR THE FIRST TIME in publishing history there is now available for model flyers a comprehensive book that includes all the fundamental data upon which the success of present day model flying is based. In addition, this important work contains valuable information that will not be found in any other book.

FOR BEGINNER OR ADVANCED STUDENT

"Model Airplane Design and Theory of Flight" eliminates the "cut and try" method. In its pages the results of 30 years of experiment in designing and flying are graphically presented with the purpose of teaching anyone how to produce consistently fine flying models. It develops a system of design, established on basic rules, that greatly simplifies the efforts of the modeler—so that the novice or expert need only apply these simple fundamental laws to achieve the goal of perfect flight.

528 Pages—205 Diagrams and Plans—Many Graphs, Formulas

This wealth of material—authentically and logically presented in 528 pages, with 205 carefully prepared diagrams and plans, numerous graphs and formulas—NOW makes simple and understandable, intricate problems that formerly were solved only by the aerodynamic engineer.

"Model Airplane Design and Theory of Flight" tackles tough problems . . . outlines best methods . . . insures understanding—and therefore *results!*

THIS BOOK WILL SOLVE YOUR MODEL PROBLEMS

In these pages will be found the answer to all your questions—for instance, a few are:

Why does a plane stall?
How can spiral dives be prevented?
How can a plane be made to fly straight?
What is the best wing section to use?
How large should the stabilizer be? the fin?
What is the center of gravity and how can it be found?
How is lift generated and calculated?
At what angle should the stabilizer be set?
How can a plane be made laterally stable?
How big should a model plane be? How much power should it have?
What makes a plane nose dive?
What size propeller should be used?
How can blade area be calculated?
What pitch is required for a given flying speed?
How do gas model propellers differ from rubber props?
How much rubber should be used in a motor for any given weight?
How many turns can be stored in a motor?
What makes a gas engine run?
How can a model be made stable yet efficient?

Major AL WILLIAMS Says:

". . . and now this greatly needed book appears with all its important data, practical instructions, and a general wealth of information which—to my knowledge—has never before been assembled in any comparable manner. . . . I know it will richly serve through the years in guiding and training the air-minded youth of our country."
Al Williams.

Indispensable Handbook for All Modelers

As a reference work alone, this book will be valued and frequently consulted—the handiest tool on the workbench.

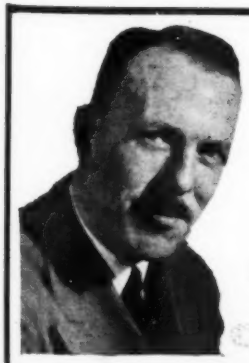
This volume is divided into six major parts:

I. The essential factors of flight, and basic information concerning lifting surfaces.
II. Stability. What it is—how to obtain it—and the theory involved.
III. How to proportion propellers; and the relationship of the factors involved.
IV. Comprehensive data on power delivered by rubber motors of all types and sizes; also, gas engine operation explained.
V. Procedure in designing all types of models: Stick, Fuselage, Speed, Distance, Duration and Gas.
VI. Control. How to check for adjustment and balance—before and after test flights.

Each Part contains a complete summary.

HOW TO OBTAIN YOUR COPY

Order now for your copy of the limited first edition. The price, $3.75, is unusually low for a full size, technical reference work—made possible through *Model Airplane News* publishing facilities. *Place your order now!*



THE AUTHOR

Charles Hampson Grant

received his training at Princeton Engineering School and Massachusetts Institute of Technology which led to designing U.S. army ships in World War I. His glider experiments and work with large planes as early as 1911 earned a coveted membership in the "Early Birds." For 20 years he has been the world's foremost model flying authority, and for the past ten years has been Editor of MODEL AIRPLANE NEWS*—all of which is reflected in this, his life's work.*

PLACE YOUR ORDER NOW

MODEL AIRPLANE NEWS M3
551 Fifth Avenue, New York, N. Y.

Please send me postpaid a copy of C. H. Grant's new book "MODEL AIRPLANE DESIGN and THEORY OF FLIGHT," for which I enclose $3.75. (Outside U. S. $4.50)

Name .....

Address .....

City ..... State .....

CLASSIFIED DIRECTORY

Advertise in this directory for quick profitable results! Rates 10c per word including name and address. Minimum 20 words. REMITTANCES MUST ACCOMPANY ALL ADS FOR THIS DIRECTORY. Advertisements for April issue must be in by Feb. 9th.

MOTORS, new and used. Parts and repair service. Highest allowance for your old motor. Write before you buy and save money. Huber, Tariff St., Sayville, New York.

MODELS: All sizes and types made to order. Solid models $5.00 up. Gas models start at $12.00. Write today. Craftsman's Service, Bristol, Vermont.

EXCELLENT Drafting Course $2.00 complete! Money back guarantee. Write for circular. Giles, Dept. M., 1326 N. Myers St., Burbank, Calif.

teries and forty-eight 50-calibre machine-guns mounted in banks of four or eight, as in the British "pom-pom" arrangement. (Rifle calibre in the case of large bore guns refers to the barrel length divided by the bore, rather than the bore itself as in the case of small rifles and machine-guns.)

These 5-inch 25-calibre anti-aircraft guns have an elevation of 90° and fire a variety of HE (high-explosive) and shrapnel shells weighing from 50 to 102 pounds each. The latter can be fired at 25 rounds per minute, the former 12 rounds per minute. Mounted on either side of the superstructure deck, these guns fire shells which, upon explosion, cover an effective area (spherical) of 200 cubic yards.

The 50-calibre machine-guns have a rate-of-fire of 600-700 rounds per minute. Mounted in banks, they offer a murderous hail of fire to the marauding enemy airman and can be quickly and easily handled on special swivel mounts.

Now being perfected is the 1.6-inch automatic-cannon anti-aircraft gun which fires an explosive shell with a super-sensitive fuse. These guns have a rate-of-fire of 120-150 rounds per minute and a range sufficient to hit any bomber.

To combat the torpedo menace from both airplanes and submarines, our new battleships (class of 1937-40 represented by the "U.S.S. North Carolina") have welded-seams throughout the armor belt, thus effectively preventing sprung plates and minimizing subsequent damage from torpedo attack. For this reason she has no port-holes below the maindeck as on older battleships. In addition she carries deck armor and funnel screens to prevent a recurrence of the "Arizona" tragedy.

But main protection of battleships lies in escorting fighter planes swarming about her and warding off attacking bombers. Battle formation always includes carriers and with them their spawn of wicked little multi-gun single-seat fighter planes, fastest and most deadly in the entire world. Tricky, maneuverable and dangerous, these vicious hornets might well shoot an attacking bomber to pieces before it nears the intended victim. Carrying an even greater responsibility are the scout-bombers and scout-observation machines whose duty it is to announce the enemy bombers' approach and thus order fighters up into their protective convoy.

The airplane gives the battleship in effect longer vision, greater firepower, vastly greater speed and maneuverability and its sole protection against enemy bombing planes. Used together these two military weapons present a formidable obstacle to an approaching foe. The future holds an even greater and more powerful relationship between them.

Tomorrow's bombers must carry bombs with far greater destructive power through increased velocities achieved, perhaps through use of small rocket charges. Torpedo-bombers carrying five or six torpedoes may soon be with the fleet and thus be capable of destroying enemy battleships without submarine or other support.

Tomorrow's battleships may carry heavier deck armor up to 16 inches (although at present more than 40% of the battleship's total displacement is taken up by armor plate alone) more powerful and more numerous anti-aircraft batteries, a streamlined superstructure and perhaps even "veed" decks sloping to cause enemy bombs to ricochet. But they must, and will, have adequate aerial support constantly on the alert against surprise attacks such as wrote history's blackest page at Pearl Harbor.

Our Navy, battleships, airplanes and men working together in a loyal, united force will prove its mettle, and who knows but what this World War II may bring new traditions of glory and valor to it which far surpass those epics of John Paul Jones and the "Bon Homme Richard," Stephen Decatur at Tripoli, George Dewey at Manila, and Edward Preble and the "U.S.S. Constitution?"

VICTORY

PRINTED IN U.S.A.

COMET brings you the models that are in tune with the times

START 'EM FLYING
KEEP 'EM FLYING

Model Aero Clubs—
Register now in National Defense Roll Call. Applications and information may be obtained from Academy of Model Aeronautics, Willard Hotel, Washington, D. C.

COMET

TODAY'S model builder wants to build today's models — ships that hold the headlines, that roar forth day after day to defend America and defeat the enemy. Comet supplies these ships, in models amazingly faithful to the original, soundly designed, thoroughly tested and easily built. . . . Typical of the many Comet models in tune with the times is the Vultee Vanguard, illustrated here: an exact-scale flying model with bomb-dropping device and other unique features; wingspan 43¾". Kit No. T2, a great value at $1.95. (Postage 25c, or order from dealer.) And ask your dealer for Comet's Lockheed Lightning, wingspan 37", Kit No. L8—only 65c. (Postage 10c, or order from dealer.)

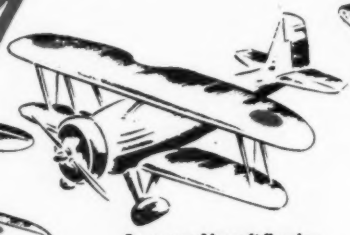
OMET MODEL AIRPLANE & SUPPLY COMPANY

W. 29th St., CHICAGO • See opposite page for listing of Comet distributors. Dept. MN-3 • 559 Sixth Ave., NEW YORK

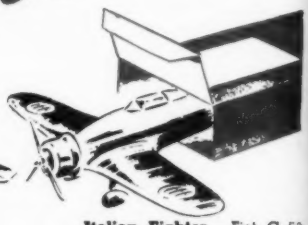
Megow SOLID MODELS FOR Spotting Enemy Planes!

6 for only 50¢

German Fighter—Heinkel He 112. Armed with two 20 mm. shell guns and two 7.7 mm. machine guns. Maximum fighting speed: 358 m.p.h. World's second fastest airplane—having set a record of 463.945 m.p.h.



Japanese Aircraft Carrier Fighter—Nakajima 95. Single seat. 33-foot wingspan. Powered with 550 h.p. Kotobuki (Bristol) motor. Maximum speed: 215 m.p.h.



Italian Fighter—Fiat G 50 one of Italy's first fighting monoplanes. Powered with 840 h.p. Fiat A 74 RC 38 14-cylinder air-cooled radial motor. Armed with two 127 mm. machine guns. Most maneuverable of monoplane fighters, yet its speed is 299 m.p.h.

Japanese Navy Fighter—Kawanishi 95. Two-seater fighter. Catapult-launched from cruisers and battleships. Carries two bombs under wings.

GET the jump on the Axis air-power! Join up with America's thousands of sky-watchers who are ready for war duty on the home front. But first . . . you've got to learn to spot the German, Jap and Italian planes on sight. That's easy, however, with the help of these Megow non-flying models. For they're accurate down to the last detail!

In other words, this special, *low-priced* kit of enemy planes is up to Megow's usual high standard of exactness! And what's more, the plans are large and easy to follow . . . the instructions clear and readily understandable . . . the materials selected for workability and durability. Each model has an average wingspan of 6 inches. The scale is 1/8" to the foot. And the whole kit of six planes is only fifty cents! Get it from your dealer now or order by mail and enclose an extra 15c for postage.

German Fighters—Messerschmitt 109J. Single seat. Armed with 4 machine guns and 1 cannon. Powered by 1150 h.p. Daimler-Benz DB 601 motor. Maximum fighting speed: 354 m.p.h. Holds world's speed record of 469.225 m.p.h.

Japanese Army Fighter—Nakajima 96. Single seat monoplane fighter, 27½-foot wingspan. Powered with 550 h.p. Nakajima (Jupiter) motor. Maximum speed: 243 m.p.h.

Send 15c postage for big, new 1942 Megow Catalog of Model Airplanes, Ships and Railroads. Megow, Philadelphia, Penna.

Megow

World Famous Hobbycraft Construction Kits!

Airplanes

Ships

Railroads